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Aventis Pharma Limited, Aventis House, 50 Kings Hill  
Avenue, Kings Hill, West Malling, Kent ME19 4AH (GB).

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(74) Agents: JONES, Stephen, Anthony et al.; Broadway  
Business Centre, 32a Stoney Street, Nottingham NG1 1LL  
(GB).

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(71) Applicant (*for all designated States except US*): **AVENTIS  
PHARMA LIMITED** [GB/GB]; Aventis House, 50 Kings  
Hill Avenue, Kings Hill, West Malling, Kent ME19 4AH  
(GB).

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **HAYES, Ian,**  
**McDonald** [GB/GB]; Aventis Pharma Limited, Aventis  
House, 50 Kings Hill Avenue, Kings Hill, West Malling,  
Kent ME19 4AH (GB). **JUPP, Raymond, Anthony**  
[GB/GB]; Aventis Pharma Limited, Aventis House, 50  
Kings Hill Avenue, Kings Hill, West Malling, Kent ME19  
4AH (GB). **POLLACK, William, Kenneth** [GB/GB];

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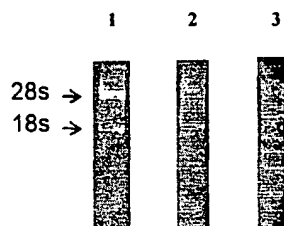
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(54) Title: POLYNUCLEOTIDES AND POLYPEPTIDES

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Gel analysis of RNA isolated using the RNazol modified methodology.  
(Lane:1 Eosinophils, Lane:2 Neutrophils, Lane:3 Molecular weight marker)

(57) Abstract: The present invention relates to polynu-  
cleotide and polypeptide sequences which are associated  
with eosinophil mediated inflammatory diseases, such as  
asthma. The invention also relates to means and methods  
for modulating the expression and/or activity of these  
sequences, preferably in the treatment or prevention of  
inflammatory disease mediated by eosinophils. Screening  
assays for agents which act as agonists or antagonists of  
these polynucleotides or polypeptides are also provided.

## POLYNUCLEOTIDES AND POLYPEPTIDES

### FIELD OF THE INVENTION

- 5     The present invention relates to polynucleotides and polypeptide sequences, and in particular relates to methods and means for the use of these polynucleotide and polypeptide sequences in the diagnosis, prevention and treatment of diseases mediated by eosinophils or other leukocytes, such as inflammatory disease.
- 10    The present invention also relates to the methods and means for modulating the expression and/or activity of such polynucleotides and polypeptides, and to agents which act as agonists or antagonists of these polynucleotides or polypeptides, and methods for identification of such agents.
- 15    The invention also provides oligonucleotide probes and primers, immunoassay kits and methods incorporating these polynucleotides.

### BACKGROUND OF THE INVENTION

- 20    Inflammation is an essential protective process preserving the integrity of an organism against physical, chemical and infectious insults. The cellular basis of the inflammation is complex but is, in many cases, dependent on the biological activity of inflammatory leukocytes, including eosinophils [see Gleich G.J. and Adolphson C.R. (1986) The eosinophilic leukocyte, structure and function. *Adv. Immunol.* 39, 177-253; Giembycz M.A. & Lindsay M.A. (1999) *Pharmacol. Rev.*
- 25    51, 213-339], neutrophils, basophils, mast cells (granulocytes), Tand B -lymphocytes, monocytes and macrophages [see Asthma (1997) Lippencott-Raven, eds Barnes P.J., Grunstein M.M., Leff A.R. & Woolcock A.J.]. Where these cells migrate into the tissues, the key cell/cell interaction is with the vascular endothelium [see Prober J.S. & Cotran R.S. (1990) : The role of the endothelium in Inflammation, *Transplantation* 50, 537-544.] In many cases inappropriate
- 30    recruitment, proliferation, survival and/or activation of specific leukocytes within a particular organ or tissue will manifest itself as "disease", for example asthma or chronic bronchitis in the lungs, rheumatoid arthritis in the joints or inflammatory bowel disease in the gut. Co-ordination of the inflammatory process is complex and is dependent upon specific gene expression of proteins on the surface of cells to enable cell/cell contact [eg, vascular cell adhesion molecule -1
- 35    (VCAM-1) on endothelial cells interacts with the alpha -4 beta- 1 integrin (VLA4) on eosinophils], within the cell to enable intracellular signalling/activation, and within the cell to

produce inflammatory mediators including eicosanoids [Goetzl E.J., An S. & Smith W.I. (1995) FASEB 9, 1051-1058] chemokines and cytokines [ see Arai K-I, Lee F., Miyajima A., Miyatake S., Arai N. & Yokata T (1990) Ann. Rev. Biochemistry 59, 783-836.] Given the range of tissues, cells and mediators involved, the inflammatory response in different disease states has many common  
5 features and also many unique features. It is likely that novel genes that are identified from the eosinophil could play an exclusive role in eosinophil biology as it pertains to asthma, but also to other eosinophilic diseases such as atopic dermatitis, hyper-eosinophilic syndrome or pulmonary fibrosis. Novel genes identified in the eosinophil may play other important roles, for example in the biology of other leukocytes; the pathology of inflammatory lung disease other than asthma;  
10 or the pathology of any other inflammatory diseases such as rheumatoid arthritis, inflammatory bowel disease (IBD), etc.

Asthma is a chronic inflammatory disease of the airways that is characterised by airway hyper-reactivity to exogenous stimuli, inflammatory cell accumulation and airway remodelling. In  
15 general terms, asthma causes chronic recurring episodes of coughing, wheezing, chest tightness and difficulty in breathing which can progress to life threatening severity. Exogenous stimuli responsible for precipitating an asthma attack can include airborne antigens, (pollens, dust mite antigens etc), chemical irritants in pollution, orally derived antigens and other unspecified stimuli. Whilst there is believed to be a genetic predisposition to disease, with an estimated 40-  
20 60% heritability, environmental factors undoubtedly play a causal role. Symptomatically the disease can be segmented into intermittent disease with sporadic episodes, persistent disease with mild, moderate and severe severity, and acute severe episodes. Current treatments for asthma range from intermittent bronchodilator therapy (inhaled on demand) to chronic high dose glucocorticosteroids. The use of glucocorticoids in particular is compromised by side effects,  
25 notably growth suppression in children that may result from disruption of normal endocrine control of growth and/or a direct effect on bone metabolism in both children or adults. Thus, the identification of novel therapies capable of resolving the chronic inflammatory process without causing side effects would be advantageous. At present many treatments for asthma rely on inhalation delivery. The development of novel, safe, oral therapy with a low frequency of dosing  
30 would be particularly advantageous. Many aspects of airway dysfunction are a direct consequence of the underlying airway inflammation that is initiated and sustained by inappropriate proliferation, and/or recruitment and/ or activation of T lymphocytes, B lymphocytes and eosinophils. Asthmatic lungs are characterised by large populations of infiltrating CD4<sup>+</sup> T cells that secrete pro-inflammatory cytokines including IL4, IL13 and IL5.  
35 Such T cells are clonally selected by prior exposure to specific antigens and will then respond to secondary antigen exposure with clonal expansion and the production of pro-inflammatory

mediators. However a key characteristic of asthma is systemic and airway eosinophilia. Eosinophils are terminally differentiated leukocytes which make up less than 1% of the leukocyte population in normal individuals and concomitantly trafficking of eosinophils through the normal airways is low. By contrast in asthmatics the circulating levels of eosinophils rises dramatically and can constitute 5-10% of the leukocyte population. Eosinophil myelopoiesis occurs in the bone marrow under the influence of T cell derived cytokines such as IL3, GM-CSF and IL5. These circulating eosinophils are actively recruited into the airways by chemo-attractants, including chemokines (eotaxin, RANTES) and leukotriene B<sub>4</sub>. Eosinophils bind to vascular endothelial cells in the airways in an integrin dependent manner and then migrate into the tissues. In normal airways such migrating cells undergo apoptosis and are rapidly cleared, whereas in asthmatics eosinophils are rescued from apoptosis by pro-inflammatory cytokines, including interleukin-5. Together, the increase in availability, recruitment and longevity of eosinophils establishes a tissue eosinophilia in the asthmatic lung. Once resident in the airways eosinophils are activated by a range of pro-inflammatory stimuli including peptido-leukotrienes, platelet activating factor (PAF) complement and sensory neuropeptides. Activation causes the eosinophils to release toxic mediators including major basic protein, eosinophil derived neurotoxin and eosinophil cationic protein that are responsible for direct tissue injury notably within the sub-epithelial basement membrane. In addition eosinophils themselves generate pro-inflammatory cytokines and eicosanoids.

It is therefore apparent that the eosinophil plays an important causal role in the pathogenesis of inflammatory diseases such as asthma and thus represents an important cellular target for the identification and exploitation of novel drug targets. The most effective anti-inflammatory treatment for asthma which has an impact on eosinophilia is the use of glucocorticosteroids. It is worth noting that the eosinophil, unlike the T cell and the neutrophil is an expendable commodity in normal physiology, given that the normal function of the eosinophil is targetting, killing and expulsion of parasites during chronic parasitic infections.

Another inflammatory disease is COPD (chronic obstructive pulmonary disease) which is characterised by irreversible airway obstruction and encompasses both chronic bronchitis and emphysema. Although COPD has a clinical phenotype and an aetiology that is quite distinct from asthma, as an inflammatory lung disease COPD also has characteristics common to asthma. The major conditions commonly contributing to COPD are chronic bronchitis and emphysema. Changes in airway resistance arises from loss of elastic recoil, narrowing of the distal airways and changes to the airway wall contribute to intrinsic air flow obstruction. The most important risk factor for the development of COPD is cigarette smoking. However it is estimated that only



15% of smokers go on to develop symptoms of COPD. In COPD, lung inflammation predominantly involves neutrophils, interleukin-8 is the cytokine which is most strikingly increased and the increased lymphocytes are type 1 helper T-cells (CD8 T-cells). However the precise role of neutrophils in the lumen of the airways in COPD is not yet established, but it is likely that the release of enzymes such as neutrophil elastase and matrix metalloproteinases (MMP) may contribute to the pathophysiology of the disease. Macrophage numbers are increased by 5-10 times in the airways of patients with COPD and these cells play an important role in driving the inflammatory process by directly producing inflammatory mediators including proteases and neutrophil chemotactic factors. In particular macrophages may be responsible for the continued proteolytic activity observed in the lungs of patients with emphysema. It is likely that some of the novel genes described here may play a role in macrophage or neutrophil biology and as such may play a contributory role in the pathology of COPD. The current therapies for COPD provide modest therapeutic benefit and there are no currently available treatments that influence its progressive cause. In contrast to asthma, COPD is resistant to treatment with glucocorticosteroids and the disease is treated symptomatically with anti-infectives, bronchodilators and mucolytics. Recent data suggest that PDE4 inhibitors may be effective in COPD.

A number of other diseases have been identified that are associated with hyper-eosinophilia [see Kroegel C., Warner J.A., Virchow J.C. & Matthys H. (1994) The Eosinophil Leucocyte(partII)Eur. Resp. J. 7, 743-760. These include allergic disorders such as atopic dermatitis and NERDS (nodules eosinophilia, rheumatism, dermatitis and swelling), vasculitic granulomatous diseases including polyarteritis and Wegeners granulomatosis, auto-immune diseases, interstitial and other pulmonary diseases including eosinophilic pneumonia, sarcoiditis and idiopathic pulmonary fibrosis, and neoplastic and myoproliferative diseases including hypereosinophilic syndrome, T cell lymphoma and hodgkins disease.

Thus, there is a need in the art to suppress or inhibit the eosinophil functions that render these leukocytes pivotal in the pathogenesis of inflammatory diseases, particularly asthma. Naturally, such functions are likely to be important in other inflammatory processes involving eosinophils. In particular, there is a need to identify genes that are expressed inappropriately in asthmatics, compared to normals, and which may thus represent suitable targets for pharmaceutical intervention. There is further a need to identify genes encoding proteins that are expressed in normal eosinophils, which regulate eosinophil activation, but that are absent, not expressed normally, or function poorly in asthmatics. There is a particular need to identify genes encoding proteins that affect eosinophil development (myelopoiesis), recruitment (adhesion, chemotaxis),

and longevity (e.g. genes involved in apoptosis, or production of chemokines, cytokines, metabolic proteins and toxic secretory proteins). There is also a need to identify genes and gene products that are of diagnostic value, which permit or assist in the diagnosis and differentiation of conditions characterised by inflammation, for example diseases which may cause symptoms such as wheeze, cough, tightness of the chest, breathing difficulties and/or the presence of inflammatory mediators or leukocytes in the airways. There is also a need to identify genes and gene products that are of prognostic value, to assist in the treatment of inflammatory disease such as asthma or which permit different treatments to be evaluated.

There is also a need to identify genes and gene products that are of therapeutic value, which permit or assist in the treatment of inflammatory disease, such as those characterised by wheeze, cough, tightness of the chest difficulty breathing and/or the presence of inflammatory mediators or leukocytes in the airways.

There is also a need to identify genes and gene products whose action can be modified to provide new modes of therapeutic intervention, to assist in the treatment and management of inflammatory disease, such as those characterised by wheeze, cough, tightness of the chest difficulty breathing and/or the presence of inflammatory mediators or leukocytes in the airways.

## **BRIEF DESCRIPTION OF THE DRAWINGS**

Figure 1 depicts Gel analysis of RNA isolated using the RNazol modified methodology (lane 1: Eosinophils, lane 2: Neutrophils, lane 3: Molecular weight marker).

Figure 2 shows the size range of the amplified cDNA which was between 200bp and 7kb.

Figure 3 shows a restriction digest of a cDNA library.

Figure 4 shows replacement primers for SMART PCR cDNA synthesis kit.

Figure 5 shows the additional 8bp sites which are used to modify the pSKII (Stratagene) vector.

**DEFINITIONS**

The following definitions are provided to facilitate understanding of certain terms used frequently herein:-

In a specific embodiment, the term "about" or "approximately" means within 20%, preferably within 10%, and more preferably within 5% of a given value or range.

10 "Agonist", as used herein, refers to a molecule which, when bound to a polypeptide of the invention increases or prolongs the duration of the effect of the polypeptide. Agonists may include proteins, nucleic acids, carbohydrates or any other molecules which bind to and modulate the activity of a polypeptide of the invention.

15 "Amplification", as used herein, relates to the production of additional copies of a nucleic acid sequence. Amplification is generally carried out using polymerase chain reaction (PCR) technologies well known in the art. (See, e.g., Dieffenbach, C.W. and G.S. Dveksler (1995) PCR Primer. a Laboratory Manual, Cold Spring Harbor Press, Plainview, NY, pp. 1-5.)

20 "Antagonist", as used herein, refers to a molecule which when bound to a polypeptide of the invention decreases the amount or the duration of the effect or the immunological activity of a polypeptide of the invention. Antagonists may include proteins, nucleic acids, carbohydrates, antibodies or any other molecule which decrease the effect of a polypeptide of the invention.

25 "Antibodies", as used herein, includes polyclonal and monoclonal antibodies, chimeric, single chain, and humanized antibodies as well as Fab fragments, including the products of an Fab or other immunoglobulin expression library.

30 "Antigenic determinant", as used herein, refers to that fragment of a molecule (i.e. an epitope) that makes contact with a particular antibody. When a protein or a fragment of a protein is used to immunise a host animal, numerous regions of the protein may induce the production of antibodies which bind specifically to antigenic determinants (given regions or three-dimensional structures on the protein). An antigenic determinant may compete with  
35 the intact antigen (i.e., the immunogen used to elicit the immune response) for binding to an antibody.

"Antisense", as used herein, refers to any composition containing a nucleic acid sequence which is complementary to a specific nucleic acid sequence. The term "antisense strand" is used in reference to a nucleic acid strand that is complementary to the "sense" strand. Antisense molecules may be produced by any method including synthesis or transcription. Once introduced into a cell, the complementary nucleotides combine with natural sequences produced by the cell to form duplexes and to down regulate or block either transcription or translation. The designation "negative" can refer to the antisense strand, and the designation "positive" can refer to the sense strand.

"Biologically active", as used herein, refers to a protein having structural, regulatory, or biochemical functions of a naturally occurring molecule. Likewise, "immunologically active" refers to the capability of the natural, recombinant, or synthetic protein, or of any oligopeptide thereof, to induce a specific immune response in appropriate animals or cells and to bind with specific antibodies.

"Cassette", as used herein, refers to a segment of DNA that can be inserted into a vector at specific restriction sites. The segment of DNA encodes a polypeptide of interest, and the cassette and restriction sites are designed to ensure insertion of the cassette in the proper reading frame for transcription and translation.

"Cloning vector", as used herein, is a replicon, such as plasmid, phage or cosmid, to which another DNA segment may be attached so as to bring about the replication of the attached segment. Cloning vectors may be capable of replication in one cell type, and expression in another ("shuttle vector").

"Coding sequence", as used herein, is a double-stranded DNA sequence which is transcribed and translated into a polypeptide in a cell *in vitro* or *in vivo* when placed under the control of appropriate regulatory sequences. The boundaries of the coding sequence are determined by a start codon at the 5' (amino) terminus and a translation stop codon at the 3' (carboxyl) terminus. A coding sequence can include, but is not limited to, prokaryotic sequences, cDNA from eukaryotic mRNA, genomic DNA sequences from eukaryotic (*e.g.*, mammalian) DNA, and even synthetic DNA sequences. If the coding sequence is intended for expression in a eukaryotic cell, a polyadenylation signal and transcription termination sequence will usually be located 3' to the coding sequence.

"Complementary" or "complementarity", as used herein, refer to the natural binding of polynucleotides under permissive salt and temperature conditions by base pairing. For example, the sequence "A-G-T" binds to the complementary sequence "T-C-A."

5        Complementarity between two single-stranded molecules may be "partial" such that only some of the nucleic acids bind, or it may be "complete" such that total complementarity exists between the single stranded molecules. The degree of complementarity between nucleic acid strands has significant effects on the efficiency and strength of the hybridization between the nucleic acid strands. This is of particular importance in amplification reactions, which  
10        depend upon binding between nucleic acids strands.

      A "composition comprising a given polynucleotide sequence" or a "composition comprising a given amino acid sequence", as these terms are used herein, refer broadly to any composition containing the given polynucleotide or amino acid sequence. The composition  
15        may comprise a dry formulation, an aqueous solution, or a sterile composition. Compositions comprising polynucleotide sequences may be employed as hybridization probes. The probes may be stored in freeze-dried form and may be associated with a stabilising agent such as a carbohydrate. In hybridisation's, the probe may be deployed in an aqueous solution containing salts (e.g NaCl), detergents (e.g., SDS), and other components (e.g., Denhardt's  
20        solution, dried milk, salmon sperm DNA, etc.).

      "Consensus sequence", as used herein, refers to a nucleic acid sequence which has been resequenced to resolve uncalled bases, extended using XL-PCRTM (Perkin Elmer, Norwalk, CT) in the 5' and/or the 3' direction, and resequenced, or which has been assembled from the  
25        overlapping sequences of more than one Clone using a computer program for fragment assembly, such as the GELVIEW<sup>TM</sup> Fragment Assembly system (GCG, Madison, W I). Some sequences have been both extended and assembled to produce the consensus sequence .

      The term "corresponding to" is used herein to refer to similar or homologous sequences,  
30        whether the exact position is identical or different from the molecule to which the similarity or homology is measured. A nucleic acid or amino acid sequence alignment may include spaces. Thus, the term "corresponding to" refers to the sequence similarity, and not the numbering of the amino acid residues or nucleotide bases.

35        "Deletion", as the term is used herein, refers to a change in the amino acid or nucleotide sequence that results in the absence of one or more amino acid residues or nucleotides.

"Derivative", as used herein, refers to the chemical modification of a polynucleotide sequence. Chemical modifications of a polynucleotide sequence can include, for example, replacement of hydrogen by an alkyl, acyl, or amino group. A derivative polynucleotide  
5 encodes a polypeptide which retains at least one biological or immunological function of the natural molecule. A derivative polypeptide is one modified by glycosylation, pegylation, or any similar process that retains at least one biological or immunological function of the polypeptide from which it was derived.

10 "Gene", as used herein, refers to an assembly of nucleotides that encode a polypeptide, and includes cDNA and genomic DNA nucleic acids.

"Heterologous DNA", as used herein, refers to DNA not naturally located in the cell, or in a chromosomal site of the cell. Preferably, the heterologous DNA includes a gene foreign to  
15 the cell.

"Heterologous protein", as used herein, refers to a protein not naturally produced in the cell.

20 "Homologous recombination", as used herein, refers to the insertion of a foreign DNA sequence into another DNA molecule, e.g., insertion of a vector in a chromosome. Preferably, the vector targets a specific chromosomal site for homologous recombination. For specific homologous recombination, the vector will contain sufficiently long regions of homology to sequences of the chromosome to allow complementary binding and incorporation of the  
25 vector into the chromosome. Longer regions of homology, and greater degrees of sequence similarity, may increase the efficiency of homologous recombination.

"Homology", as used herein, refers to a degree of complementarity. There may be partial homology or complete homology. The word "identity" may substitute for the word  
30 "homology." A partially complementary sequence that at least partially inhibits an identical sequence from hybridising to a target nucleic acid is referred to as "substantially homologous." The inhibition of hybridization of the completely complementary sequence to the target sequence may be examined using a hybridization assay (Southern or Northern blot, solution hybridization, and the like) under conditions of reduced stringency. A substantially  
35 homologous sequence or hybridization probe will compete for and inhibit the binding of a completely homologous sequence to the target sequence under conditions of reduced

stringency. This is not to say that conditions of reduced stringency are such that non-specific binding is permitted, as reduced stringency conditions require that the binding of two sequences to one another be a specific (i.e., a selective) interaction. The absence of non-specific binding may be tested by the use of a second target sequence which lacks even a partial degree of complementarity (e.g., less than about 30% homology or identity). In the absence of non-specific binding, the substantially homologous sequence or probe will not hybridise to the second non-complementary target sequence.

"Human artificial chromosomes (HACs)", as used herein, are linear microchromosomes which may contain DNA sequences of 10K to 10 M in size and contain all of the elements required for stable mitotic chromosome segregation and maintenance (Harrington J.J. et al.(1997) Nat Genet. 15:345-355).

"Hybridization", as used herein, refers to any process by which a strand of nucleic acid binds to another complementary nucleic acid molecule, such as a cDNA, genomic DNA, or RNA, through base pairing. A single stranded form of the nucleic acid molecule can anneal to the other nucleic acid molecule under the appropriate conditions of temperature and solution ionic strength (see Sambrook et al., *supra*). The conditions of temperature and ionic strength determine the "stringency" of the hybridization. For preliminary screening for homologous nucleic acids, low stringency hybridization conditions, corresponding to a  $T_m$  of 55°, can be used, e.g., 5x SSC, 0.1% SDS, 0.25% milk, and no formamide; or 30% formamide, 5x SSC, 0.5% SDS). Moderate stringency hybridization conditions correspond to a higher  $T_m$ , e.g., 40% formamide, with 5x or 6x SCC. High stringency hybridization conditions correspond to the highest  $T_m$ , e.g., 50% formamide, 5x or 6x SCC. Hybridization requires that the two nucleic acids contain complementary sequences, although depending on the stringency of the hybridization, mismatches between bases are possible. The appropriate stringency for hybridising nucleic acids depends on the length of the nucleic acids and the degree of complementation, variables well known in the art. The greater the degree of similarity or homology between two nucleotide sequences, the greater the value of  $T_m$  for hybrids of nucleic acids having those sequences. The relative stability (corresponding to higher  $T_m$ ) of nucleic acid hybridizations decreases in the following order: RNA:RNA, DNA:RNA, DNA:DNA. For hybrids of greater than 100 nucleotides in length, equations for calculating  $T_m$  have been derived (see Sambrook et al., *supra*, 9.50-0.51). For hybridization with shorter nucleic acids, i.e., oligonucleotides, the position of mismatches becomes more important, and the length of the oligonucleotide determines its specificity (see Sambrook et al., *supra*, 11.7-11.8). Preferably a minimum length for a hybridizable nucleic acid is at least about 10 nucleotides;

preferably at least about 15 nucleotides; and more preferably the length is at least about 20 nucleotides.

"Hybridization complex", as used herein, refers to a complex formed between two nucleic acid sequences by virtue of the formation of hydrogen bonds between complementary bases. A hybridization complex may be formed in solution (e.g., Cot or Rot analysis) or formed between one nucleic acid sequence present in solution and another nucleic acid sequence immobilised on a solid support (e.g., paper, membranes, filters, chips, pins or glass slides, or any other appropriate substrate to which cells or their nucleic acids have been fixed).

The words "insertion" or "addition", as used herein, refer to changes in an amino acid or nucleotide sequence resulting in the addition of one or more amino acid residues or nucleotides, respectively, to the sequence found in the naturally occurring molecule.

"Identity" is a measure of the homology of nucleotide sequences or amino acid sequences. In general, the sequences are aligned so that the highest order match is obtained. 'Identity' *per se* has an art-recognised meaning and can be calculated using published techniques. See, e.g.: (COMPUTATIONAL MOLECULAR BIOLOGY, Losk, A.M., ed., Oxford University Press, New York, 1988; BIOCUMPETING: INFORMATICS AND GENOME PROJECTS, Smith, D.W., ed., Academic Press, New York, 1993" COMPUTER ANALYSIS OF SEQUENCE DATA, PART 1, Griffin, A.M and Griffin, H.G., eds., Humane Press, New Jersey, 1994; SEQUENCE ANALYSIS IN MOLECULAR BIOLOGY, vol Heinjo, G., Academic Press, 1987; and SEQUENCE ANALYSIS PRIMER, Gribskov, M. and Devereux, J., eds., M Stockton Press, New York, 1 991). While there exist a number of methods to measure identity between two polynucleotide or polypeptide sequences, the term "identity" is well known to skilled artisans (Carillo, H., and Lipton, D., *SIAM J AppliadMath* (1 988) 48:1073). Methods commonly employed to determine identity or similarity between two sequences include, but are not limited to, those disclosed in Guide to Huge Computers, Martin J. Bishop, ed., Academic Press, San Diego, 1994, and Carillo, H., and Lipton, D., *SIAM J Applied Math* (1 988) 48:1073. Methods to determine identity and similarity are codified in computer programs. Preferred computer program methods to determine identity and similarity between two sequences include, but are not limited to, GCS program package (Devereux, J., *otal*, *NucloicAcids Research* (1984) 12(1):387), BLASTP, BLASTN, FASTA (Atschul, S.F. *et al*., *J Molec Biol*(1 990) 215:403). As an illustration, by a polynucleotide having a nucleotide sequence having at least, for example, 95% "identity" to a reference nucleotide sequence of SEO ID NO:1 is intended that the nucleotide sequence of the



polynucleotide is identical to the reference sequence except that the polynucleotide sequence may include up to five point mutations per each 100 nucleotides of the reference nucleotide sequence of SEQ ID NO: 1. In other words, to obtain a polynucleotide having a nucleotide sequence at least 95% identical to a reference nucleotide sequence, up to 5% of the nucleotides in the reference sequence may be deleted or substituted with another nucleotide, or a number of nucleotides up to 5% of the total nucleotides in the reference sequence may be inserted into the reference sequence. These mutations of the reference sequence may occur at the 5' or 3' terminal positions of the reference nucleotide sequence or anywhere between those terminal positions, interspersed either individually among nucleotides in the reference sequence or in one or more contiguous groups within the reference sequence. Similarly, by a polypeptide having an amino acid sequence having at least, for example, 95% "identity" to a reference amino acid sequence SEQ ID NO:2 it is intended that the amino acid sequence of the polypeptide is identical to the reference sequence except that the polypeptide sequence may include up to five amino acid alterations per each 100 amino acids of the reference amino acid of SEQ ID NO: 2. In other words, to obtain a polypeptide having an amino acid sequence at least 95% identical to a reference amino acid sequence, up to 5% of the amino acid residues in the reference sequence may be deleted or substituted with another amino acid, or a number of amino acids up to 5% of the total amino acid residues in the reference sequence may be inserted into the reference sequence. These alterations of the reference sequence may occur at the amino or carboxy terminal positions of the reference amino acid sequence or anywhere between those terminal positions, interspersed either individually among residues in the reference sequence or in one or more contiguous groups within the reference sequence. Percent identity or homology is a measure of the relationship between two polypeptide sequences. In general the two sequences to be compared are aligned to give a maximum correlation between the sequences. The alignment of the two sequences is examined and the number of positions giving an exact amino-acid or nucleotide correspondence between the two sequences determined, divided by the total length of the alignment and multiplied by 100 to give a % identity figure. This % identity figure may be determined over the whole length of the sequences to be compared, which is particularly suitable for sequences of the same or very similar length and which are highly homologous, or over shorter defined lengths, which is more suitable for sequences of unequal length or which have a lower level of homology.

"Immune response", as used herein, can refer to conditions associated with inflammation, trauma, immune disorders, or infectious or genetic disease, etc. These conditions can be characterised by expression of various factors, e.g., cytokines, chemokines, and other signalling molecules, which may affect cellular and systemic defence systems.

"Inflammatory disease" includes disease or conditions which are typically, but not exclusively characterised by wheeze, cough, tightness of chest, breathing difficulties and/or the presence of inflammatory mediators such as leukocytes in the airways.

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"Isolated", as used herein, means altered "by hand of man" from the natural state. If an "isolated" composition or substance occurs in nature, it has been changed or removed from its original environment, or both. For example, a polynucleotide or a polypeptide naturally present in a living animal is not "isolated" but the same polynucleotide or polypeptide separated from the coexisting materials of its natural state is "isolated" as the term is employed herein.

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"Microarray", as used herein, refers to an arrangement of distinct polynucleotides arrayed on a substrate, e.g., paper, nylon or any other type of membrane, filter, chip, glass slide, or any other suitable solid support.

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"Modulate", as used herein, refers to a change in the activity. For example modulation may cause an increase or a decrease in activity, binding characteristics, or any other biological, functional, or immunological properties and result in total inhibition or total activation.

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"Nucleic acid", as used herein, is a polymeric compound comprised of covalently linked subunits called nucleotides. Nucleic acid includes polyribonucleic acid (RNA) and polydeoxyribonucleic acid (DNA), both of which may be single-stranded or double-stranded. DNA includes cDNA, genomic DNA, synthetic DNA, and semi-synthetic DNA.

25

"Oligonucleotide", as used herein, refers to a nucleic acid sequence, of at least about 6 nucleotides to 60 nucleotides, preferably about 15 to 30 nucleotides, more preferably about 20 to 25 nucleotides, and most preferably at least 18 nucleotides, that is hybridizable to a genomic DNA molecule, a cDNA molecule, or an mRNA molecule. Oligonucleotides can be labelled, e.g., with <sup>32</sup>P-nucleotides or nucleotides to which a label, such as biotin, has been covalently conjugated. In one embodiment, a labelled oligonucleotide can be used as a probe to detect the presence of a nucleic acid. In another embodiment, oligonucleotides (one or both of which may be labelled) can be used as PCR primers, either for cloning full length sequences or fragments thereof, or to detect the presence of specific polynucleotides. In a further embodiment, an oligonucleotide of the invention can form a triple helix with a DNA

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molecule. In further embodiments they can be in hybridization assays or microarrays. Generally, oligonucleotides are prepared synthetically, preferably on a nucleic acid synthesiser. Accordingly, oligonucleotides can be prepared with non-naturally occurring phosphoester analog bonds, such as thioester bonds, etc. As used herein, the term  
5 "oligonucleotide" is substantially equivalent to the terms "amplimer," "primer," "oligomer," and "probe," as these terms are commonly defined in the art.

"Peptide nucleic acid (PNA)", as used herein, refers to an antisense molecule or anti-gene agent which comprises an oligonucleotide of at least about 5 nucleotides in length linked to a  
10 peptide backbone of amino acid residues ending in lysine. The terminal lysine confers solubility to the composition. PNAs preferentially bind complementary single stranded DNA and RNA and stop transcript elongation, and may be pegylated to extend their lifespan in the cell. (See eg., Nielsen, P. E. et al (1993) Anticancer Drugs Des. 8:53-63).

"Polynucleotide" generally refers to any polyribonucleotide or polydeoxribonucleotide, which may be unmodified RNA or DNA or modified RNA or DNA. "polynucleotides" include, without limitation single- and double-stranded DNA, DNA that is a mixture of single- and double-stranded regions, single- and double-stranded RNA, and RNA that is mixture of single- and double-stranded regions, hybrid molecules comprising DNA and RNA that may be  
20 single-stranded or, more typically, double-stranded or a mixture of single- and double-stranded regions. In addition, 'polynucleotide' refers to triple-stranded regions comprising RNA or DNA or both RNA and DNA. The term polynucleotide also includes DNAs or RNAs containing one or more modified bases and DNAs or RNAs with backbones modified for stability or for other reasons. "Modified" bases include, for example, tritylated bases and  
25 unusual bases such as inosine. A variety of modifications have been made to DNA and RNA; thus, "polynucleotide" embraces chemically, enzymatically or metabolically modified forms of polynucleotides as typically found in nature, as well as the chemical forms of DNA and RNA characteristic of viruses and cells. "Polynucleotide" also embraces relatively short polynucleotides, often referred to as oligonucleotides.

"Polypeptide", as used herein, refers to any peptide or protein comprising two or more amino acids joined to each other by peptide bonds or modified peptide bonds, i.e., peptide isosteres. "Polypeptide" refers to both short chains, commonly referred to as peptides, oligopeptides or oligomers, and to longer chains, generally referred to as proteins.  
35 Polypeptides may contain amino acids other than the 20 gene-encoded amino acids. "Polypeptides" include amino acid sequences modified either by natural processes, such as

post-translational processing, or by chemical modification techniques which are well known in the art. Such modifications are well described in basic texts and in more detailed monographs, as well as in the research literature. Modifications can occur anywhere in a polypeptide, including the peptide backbone, the amino acid side-chains and the amino or carboxyl termini. It will be appreciated that the same type of modification may be present in the same or varying degrees at several sites in a given polypeptide. Also, a given polypeptide may contain many types of modifications. Polypeptides may be branched as a result of ubiquitination, and they may be cyclic, with or without branching. Cyclic, branched and branched cyclic polypeptides may result from post-translation natural processes or may be made by synthetic methods. Modifications include acetylation, acylation, ADP-ribosylation, amidation, covalent attachment of flavin, covalent attachment of a heme moiety covalent attachment of a nucleotide or nucleotide derivative, covalent attachment of a lipid or lipid derivative, covalent attachment of phosphatidylinositol, cross-linking, cyclization, disulphide bond formation, demethylation, formation of covalent crosslinks, formation of cystine, formation of pyroglutamate, formylation, gamma-carboxylation, glycosylation, GPI anchor formation, hydroxylation, iodination, methylation, myristoylation, oxidation, proteolytic processing, phosphorylation, prenylation, racemization, selenoylation, sulfation, transfer-RNA mediated addition of amino acids to proteins such as arginylation, and ubiquitination. See, for instance, *PROTEINS - STRUCTURE AND MOLECULAR PROPERTIES*, 2nd Ed., T. E. Creighton, W. H. Freeman and Company, New York, 1993 and Wold, F, *Posttranslational Protein Modifications: Perspectives and Prospects*, pgs. 1-12 in *POSTTRANSLATIONAL COVALENT MODIFICATION OF PROTEINS*, B.C. Johnson, Ed., Academic Press, New York, 1983; Seifter *et al.*, 'Analysis for protein modifications and non-protein cofactors', *Meth Enzymol* (1990) 182:626-646 and Rattan *et al.*, 'Protein Synthesis: Post-translational Modifications and Aging', *Ann NY Acad Sci* (1992) 663:48-62.

"Probe(s)", as used herein, is a sequence specific polynucleotide or oligonucleotide which is used in the procedure of hybridisation to identify, interrogate or probe, a complex mixture of polynucleotides in a sample, or target through sequence specific complementarity. The probe may be tagged with a label (radioactive, fluorescent or other) as a means to identify complementary polynucleotides. Alternatively the probe may be attached to, or synthesised on the surface of a chip, slide, filter or other material. In the latter instance the target or sample may be labelled (radioactive, fluorescent or other). The term Probe, is also used to describe the use of an 'electronic' sequence specific polynucleotide or oligonucleotide which is used in the procedure of 'electronic' hybridisation to identify, interrogate or probe, a complex mixture

of 'electronic' polynucleotides in a database or file through sequence specific complementarity.

5 "Promoter sequence", as used herein, is a DNA regulatory region capable of binding RNA polymerase in a cell and initiating transcription of a downstream (3' direction) coding sequence. For purposes of defining the present invention, the promoter sequence is bounded at its 3' terminus by the transcription initiation site and extends upstream (5' direction) to include the minimum number of bases or elements necessary to initiate transcription at levels detectable above background. Within the promoter sequence will be found a transcription  
10 initiation site (conveniently defined for example, by mapping with nuclease S1), as well as protein binding domains (consensus sequences) responsible for the binding of RNA polymerase.

15 "Recombinant DNA molecule", as used herein, is a DNA molecule that has undergone a molecular biological manipulation.

"Regulatory region", as used herein, means a nucleic acid sequence which regulates the expression of a second nucleic acid sequence. A regulatory region may include sequences which are naturally responsible for expressing a particular nucleic acid (a homologous region) or may include sequences of a different origin which are responsible for expressing different  
20 proteins or even synthetic proteins (a heterologous region). In particular, the sequences can be sequences of eukaryotic or viral genes or derived sequences which stimulate or repress transcription of a gene in a specific or non-specific manner and in an inducible or non-inducible manner. Regulatory regions include origins of replication, RNA splice sites, promoters, enhancers, transcriptional termination sequences, signal sequences which direct  
25 the polypeptide into the secretory pathways of the target cell, and promoters.

"Sample", as used herein, may comprise a bodily fluid; an extract from a cell, chromosome, organelle, or membrane isolated from a cell; a cell; genomic DNA, RNA, or  
30 cDNA, in solution or bound to a solid support; a tissue; a tissue print; etc.

"Sequence similarity" or "homology", as used herein, refers to the degree of identity or correspondence between nucleic acid or amino acid sequences of proteins that may or may not share a common evolutionary origin (see Reeck et al., supra). However, in common usage and  
35 in the instant application, the term "homologous," when modified with an adverb such as "highly," may refer to sequence similarity and not a common evolutionary origin. In a

specific embodiment, two DNA sequences are "substantially homologous" or "substantially similar" when at least about 50% (preferably at least about 75%, and most preferably at least about 90 or 95%) of the nucleotides match over the defined length of the DNA sequences. Sequences that are substantially homologous can be identified by comparing the sequences using standard software available in sequence data banks, or in a Southern hybridization experiment under, for example, stringent conditions as defined for that particular system. Defining appropriate hybridization conditions is within the skill of the art. See, e.g., Maniatis et al., supra; DNA Cloning, Vols. I & II, supra; Nucleic Acid Hybridization, supra. Two amino acid sequences are "substantially homologous" or "substantially similar" when greater than about 40% of the amino acids are identical, or greater than 60% are similar (functionally identical). Preferably, the similar or homologous sequences are identified by alignment using, for example, the GCG (Genetics Computer Group, Program Manual for the GCG Package, Version 7, Madison, Wisconsin) pileup program.

"Signal sequence", as used herein, is a sequence included at the beginning of the coding sequence of a protein to be expressed on the surface of a cell. This sequence encodes a signal peptide, N-terminal to the mature polypeptide, that directs the host cell to translocate the polypeptide. The term "translocation signal sequence" is used herein to refer to this sort of signal sequence. Translocation signal sequences can be found associated with a variety of proteins native to eukaryotes and prokaryotes, and are often functional in both types of organisms.

"Specific binding" or "specifically binding", as used herein, refer to the interaction between a protein or peptide and an agonist, an antibody, or an antagonist. The interaction is dependent upon the presence of a particular structure of the protein, e.g., the antigenic determinant or epitope, recognised by the binding molecule. For example, if an antibody is specific for epitope "A," the presence of a polypeptide containing the epitope A, or the presence of free unlabeled A, in a reaction containing free labelled A and the antibody will reduce the amount of labelled A that binds to the antibody.

"Standard hybridization conditions", as used herein, refers to a  $T_m$  of 55°C, and utilises conditions as set forth above. In a preferred embodiment, the  $T_m$  is 60°C; in a more preferred embodiment, the  $T_m$  is 65°C

"Stringent conditions", as used herein, refers to conditions which permit hybridization between polynucleotide sequences and the claimed polynucleotide sequences. Suitably

stringent conditions can be defined by, for example, the concentrations of salt or formamide in the prehybridization and hybridization solutions, or by the hybridization temperature, and are well known in the art. In particular, stringency can be increased by reducing the concentration of salt, increasing the concentration of formamide, or raising the hybridization temperature. For example, hybridization under high stringency conditions could occur in about 50% formamide at about 37°C to 42°C. Hybridization could occur under reduced stringency conditions in about 35% to 25% formamide at about 30°C to 35°C. In particular, hybridization could occur under high stringency conditions at 42°C in 50% formamide, 5X SSPE, 0.3% SDS, and 200 µg/ml sheared and denatured salmon sperm DNA. Hybridization could occur under reduced stringency conditions as described above, but in 35% formamide at a reduced temperature of 35°C. The temperature range corresponding to a particular level of stringency can be further narrowed by calculating the purine to pyrimidine ratio of the nucleic acid of interest and adjusting the temperature accordingly. Variations on the above ranges and conditions are well known in the art.

"Substantially purified", as used herein, refers to nucleic acid or amino acid sequences that are removed from their natural environment and are isolated or separated, and are at least about 60% free, preferably about 75% free, and most preferably about 90% free from other components with which they are naturally associated.

"Substitution", as used herein, refers to the replacement of one or more amino acids or nucleotides by different amino acids or nucleotides, respectively.

"Transcriptional control sequences" and "translational control sequences", as used herein, are DNA regulatory sequences, such as promoters, enhancers, terminators, and the like, that provide for the expression of a coding sequence in a host cell. In eukaryotic cells, polyadenylation signals are control sequences. A coding sequence is "under the control" of transcriptional and translational control sequences in a cell when RNA polymerase transcribes the coding sequence into mRNA, which is then trans-RNA spliced (if the coding sequence contains introns) and translated into the protein encoded by the coding sequence.

"Transfection" by exogenous or heterologous DNA, as used herein, is when such DNA has been introduced inside the cell. A cell has been "transformed" by exogenous or heterologous DNA when the transfected DNA effects a phenotypic change. The transforming DNA can be integrated (covalently linked) into chromosomal DNA making up the genome of the cell.

"Transformation", as defined herein, describes a process by which exogenous DNA enters and changes a recipient cell. Transformation may occur under natural or artificial conditions according to various methods well known in the art, and may rely on any known method for the insertion of foreign nucleic acid sequences into a prokaryotic or eukaryotic host cell. The method for transformation is selected based on the type of host cell being transformed and may include, but is not limited to, viral infection, electroporation, heat shock, lipofection, and particle bombardment. The term "transformed" cells includes stably transformed cells in which the inserted DNA is capable of replication either as an autonomously replicating plasmid or as part of the host chromosome, as well as transiently transformed cells which express the inserted DNA or RNA for limited periods of time.

A "variant" of a polynucleotide or a polypeptide, as used herein, is any analogue, fragment, derivative, or mutant which is derived from a different reference polynucleotide or polypeptide and which retains at least one biological property of the reference polynucleotide or polypeptide. Variants of the polypeptide may exist in nature. These variants may be allelic variations characterised by differences in the nucleotide sequences of the structural gene coding for the protein, or may involve differential splicing or post-translational modification. The skilled artisan can produce synthetic polynucleotide or polypeptide variants. Changes in the nucleotide sequence of the variant may or may not alter the amino acid sequence of the polypeptide it encodes. Nucleotide changes may result in amino acid substitutions, additions, deletions, fusions and truncations in the polypeptide it encodes, as discussed below. A typical variant of a polypeptide differs in amino acid sequence from another, reference polypeptide. Generally, differences are limited so that the sequences of the reference polypeptide and the variant are closely similar overall and, in many regions, identical. A variant and reference polypeptide may differ in amino acid sequence by one or more substitutions, additions, replacements or deletions or in any combination thereof. A substituted or inserted amino acid residue may or may not be one encoded by the genetic code. Techniques for obtaining non-naturally occurring variants of polynucleotides and polypeptides include mutagenesis techniques, genetic (suppressions, deletions, mutations, etc.), chemical, and enzymatic techniques or by direct synthesis all of which are known to persons having ordinary skill in the art. Guidance in determining which amino-acid residues may be substituted inserted or deleted without abolishing biological or immunological activity may be found using computer programs well known in the art such as DNASTAR software.

"Vector", as used herein, is any means for the transfer of a nucleic acid into a host cell. A vector may be a replicon to which another DNA segment may be attached so as to bring about



the replication of the attached segment. A "replicon" is any genetic element (e.g., plasmid, phage, cosmid, chromosome, virus) that functions as an autonomous unit of DNA replication *in vivo*, i.e., capable of replication under its own control. The term "vector" includes both viral and nonviral means for introducing the nucleic acid into a cell *in vitro*, *ex vivo* or *in vivo*.

5 Viral vectors include retrovirus, adeno-associated virus, pox, baculovirus, vaccinia, herpes simplex, Epstein-Barr and adenovirus vectors, as set forth in greater detail below. Non-viral vectors include plasmids, liposomes, electrically charged lipids (cytofectins), DNA-protein complexes, and biopolymers. In addition to a nucleic acid, a vector may also contain one or more regulatory regions, and/or selectable markers useful in selecting, measuring, and  
10 monitoring nucleic acid transfer results (transfer to which tissues, duration of expression, etc.).

#### DESCRIPTION OF THE INVENTION

15 The present invention is based on the identification and isolation of polynucleotides and polypeptides associated with eosinophil-mediated disease, particularly inflammatory disease such as asthma. The present invention also relates to the use of these polynucleotides and polypeptides in diagnosis, treatment or prevention of diseases mediated by eosinophils, and to the use of oligonucleotides derived from the above polynucleotides and polypeptides as probes or  
20 primers for identification of complementary, related or contiguous oligonucleotides or as targets for screening for compounds with pharmaceutical utility or value.

In a first aspect, the present invention relates to polypeptide sequences comprising amino-acid sequences encoded by Seq ID Nos: 1-466 or fragments of those amino acid sequences.

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In a preferred embodiment of the first aspect, the invention relates to variants of the amino-acid sequences encoded by Seq ID Nos: 1-466 or fragments of those amino acid sequences, the variants having at least about 80%, more preferably at least 85%, more preferably at least 90%, and most preferably 95% amino-acid sequence identity to the amino-acid sequences encoded by  
30 Seq ID Nos: 1-466 or fragments of those amino acid sequences, and which share at least one functional or structural characteristic with the amino-acid sequences encoded by Seq ID Nos: 1-466 or fragments of those amino acid sequences.

In a second aspect the present invention relates to polynucleotide sequences which encode the  
35 amino-acid sequences encoded by Seq ID Nos: 1-466 or fragments of those amino acid sequences. Preferably, the polynucleotide sequences of the second aspect are those of Seq ID Nos: 1-466.

In a preferred embodiment of the second aspect, the invention relates to variants of the polynucleotide sequences which encode the amino-acid sequences encoded by Seq ID Nos: 1-466, in particular the polynucleotide sequences of Seq ID Nos: 1-466; or fragments thereof. The variants may have at least about 80%, more preferably at least 85%, more preferably at least 90% and most preferably 95% polynucleotide sequence identity to the polynucleotide sequences which encode the amino-acid sequences encoded by Seq ID Nos: 1-466, in particular the polynucleotide sequences of Seq ID Nos: 1-466. Preferably, the polynucleotide variants described above encode an amino-acid sequence which shares at least one functional and/or structural characteristic with one or more of the amino-acid sequences encoded by Seq ID Nos: 1-466.

As will be appreciated by those skilled in the art, as a result of degeneracy of the genetic code, a multitude of polynucleotide sequences, some bearing minimal homology to the polynucleotide sequence of any known or naturally occurring gene, may be produced. Thus, the invention contemplates each and every possible variation of polynucleotide sequence that could be made by selecting combinations based on possible codon choices. These combinations are made in accordance with the standard triplet genetic code as applied to the naturally occurring polynucleotide sequence, and all such variations are to be considered as being specifically disclosed.

The polynucleotides of the present invention can be isolated from a number of sources, including genomic libraries, foetal genomic or cDNA libraries, or more preferably from human eosinophil cDNA libraries, preferably constructed from pooled eosinophils harvested from normal or diseased individuals. General methods for obtaining the polynucleotides and polypeptides of the present invention are well known in the art (as described by See, *e.g.*, Sambrook, Fritsch & Maniatis, *Molecular Cloning: A Laboratory Manual*, Second Edition (1989) Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York).

Genomics techniques were used to study the levels of expression of genes in eosinophils in order to identify the polynucleotides and polypeptides of the present invention which have a role in eosinophil processes which mediate disease. The expression pattern of a gene provides indirect information about its function. A polynucleotide or polypeptide which is selectively expressed in eosinophils is likely to be involved in pathologies associated with the eosinophil, such as asthma, COPD, allergic disorders such as atopic dermatitis and NERDS (nodules eosinophilia, rheumatism, dermatitis and swelling), vasculitic granulomatous diseases including polyarteritis and Wegeners granulomatosis, auto-immune diseases, interstitial and other pulmonary diseases

including eosinophilic pneumonia, sarcoiditis and idiopathic pulmonary fibrosis and neoplastic and myoproliferative diseases including hypereosinophilic syndrome, T cell lymphoma and hodgkins disease. Diversion from normal physiology is frequently accompanied by histological and biochemical changes, including changes in gene expression. The up- or down-regulation of gene activity can either be the cause of the pathophysiology or the result of the disease.

The polynucleotides and polypeptides of the present invention whose modulation results in the modification of eosinophil functions enable for the first time the provision of pharmaceuticals, therapeutic agents, drug targets, gene therapy targets, diagnostic and/or prognostic markers, antibodies which have utility as therapeutic, diagnostic, prognostic, histological or purification tools, and tools for use in the detection and isolation of further polynucleotide or polypeptide sequences which may play a role in eosinophil mediated inflammatory disease.

The identification and/or targetting of polynucleotides and polypeptides according to the first and second aspects of the invention enables the development, duration, progress, outcome, or the damage caused by a disease to be modified, and may even effect a cure. Means and methods for targetting the polynucleotides and/or polypeptides of the present invention may abolish or alleviate one or more symptom of inflammatory disease and/or limit the development, duration, progress, or outcome, of the disease or minimise the damage caused by it. The polynucleotides and polypeptides of the present invention which are not directly responsible for disease may be useful in alleviating or abolishing symptoms associated with the disease.

In particular, the polynucleotides and polypeptides of the present invention may represent attractive targets for drugs. For example, the polynucleotides may be useful targets or agents for gene therapy; the polypeptides may be useful targets for agonists or antagonists which modulate the effects of the polypeptide, and thus mediate a therapeutic effect. In this way, unwanted side effects, symptoms may be alleviated or abolished and causes of the disease may be wholly or partially removed.

Detailed profiling of polynucleotide expression levels in a variety of different tissues in normal and diseased individuals at different stages of disease progression or severity, and in response to a variety of stimuli such as cytokines IL5, drugs, and steroids resulted in the identification of polypeptides and polynucleotides of the present invention. The profiling also enabled indicators of disease stage or progression to be identified, and potential drug targets to be identified.

Animal disease models enable detailed profiling of gene expression under carefully controlled experimental conditions. For example, the gene expression pattern of a normal animal can be compared against that of a related animal which has been modified in a very specific manner to, such that it either over-or under-expresses one or more selected polynucleotide sequences, or  
5 fails to express certain polynucleotide sequences, either because it lacks a functioning copy of the DNA sequence, or because the expression of the sequence has been selectively blocked, for example using antisense oligonucleotides. Such studies provide additional insight into the cellular, animal and human physiology involved in the identification and validation of therapeutic targets.

10 Investigations of the expression levels of genes in model cell lines mimicking critical eosinophil functions, such as adhesion, apoptosis, activation, myelopoiesis, synthesis of essential cellular components or mediators, and survival, aided the identification of the polynucleotides and polypeptides of the present invention which are expressed or active in the disease causing  
15 mechanisms mediated by eosinophils.

Genomics technologies enable many genes to be studied 'in parallel', thereby increasing the chance of identifying a gene or protein which has a key role in diseases mediated by eosinophils. Accordingly, a genomics approach capable of simultaneously analysing the expression levels of  
20 large numbers of polynucleotides was utilised to maximise the probability of identifying genes specifically involved in disease processes mediated by eosinophils.

Microarrays to which sequences of interest were applied were used to simultaneously analyse the expression levels of large numbers of polynucleotides. Two microarray technologies for mRNA  
25 expression profiling (review: 'The Chipping Forecast', Supplement to *Nature Genetics*, 21: 1999) were used to investigate/analyse the expression profiles of the polynucleotides of the present invention, one supplied by Affymetrix and the other by Amersham/Molecular Dynamics. Together they offer greater flexibility to generate robust, reproducible and reliable data than either system in isolation.

30 The Affymetrix technology, supplied by Affymetrix, U.S.A, comprises microarray chips of high-density oligonucleotides created using adapted photolithographic masking techniques (methodology is as described by the manufacturer; Lockhart, D.J. J. Expression monitoring by hybridisation to high-density oligonucleotide arrays. *Nature Biotechnology*, 14:1675-1680, 1996).  
35 A number of different overlapping oligonucleotide pairs corresponding to each polynucleotide sequence to be probed are designed and synthesised (one member of each pair is complementary

to the oligonucleotide sequence of interest and the other, 'control sequence' of the pair includes a single mismatched base). The Affymetrix array system requires prior knowledge of at least a part of each of the nucleotide sequences which are to be attached to the chip to enable suitable probe pairs to be designed and synthesised. This system enables genes of very high homology to be distinguished from one another. This system is very accurate and enables the expression of a large number of genes to be analysed in a single hybridisation reaction. However, once a microarray has been designed and constructed the photolithography process does not allow changes in the nucleotide sequence of the oligonucleotide probes fixed to the array to be made. Accordingly, a new microarray must be designed and synthesised to probe a different set of genes. The array is exposed to labelled cDNA or cRNA from a variety of sources (as described above) under conditions which favour hybridisation. Hybridisation patterns indicate the identity of and the quantity of expression.

The Amersham Pharmacia Biotechnology/Molecular Dynamics system involves robotically spotting up to 10,000 polynucleotide sequences, normally generated by PCR, onto specially prepared glass slides. It is not necessary to know the nucleotide sequence of the sequences before they are applied to the array. The slide is exposed to fluorescently labelled nucleic acid samples under conditions which favour hybridisation [see Schena, M et al. Quantitative monitoring of gene expression patterns with a complementary DNA microarray. *Science* 270, 467-470 (1995)]. Hybridisation patterns indicate the identity and the quantity of expression. These microarrays are very flexible and the target fragments applied to the slide can be easily changed. They can be used to determine the differential expression of large numbers of genes, although it is not suitable for those that have high levels of homology to one another.

Several different biological approaches were combined to form an integrated strategy. In the first approach, purified peripheral blood eosinophils were studied from clinically defined normal individuals (e.g. skin test, FEV1, and IgE levels within predefined parameters) and staged asthmatics (e.g. mild, moderate and severe; different values were set for these parameters).

mRNA was isolated from the eosinophils and used to prepare a cDNA library. The mRNA from a number of individuals was pooled to maximise the representation of genes that could be expressed by an eosinophil in different circumstances. A cDNA library was constructed with an average fragment size of 500-1000 base pairs. The library was designed so that the inserts could be amplified by PCR in a highly uniform process using generic vector-derived primers, to provide DNA fragments that could be directly spotted onto microarrays. Clones from these

libraries were subjected to high throughput sequencing to confirm the diversity of the library and identify novel sequences.

5 Identification of the full-length sequences can be performed using in a number of different methods. For example, the gene can be isolated from a corresponding full-length eosinophil library or a library from a commercial source. Direct cloning from mRNA using a variety of techniques such as "5' race" is also possible.

10 Microarrays were generated using the library clones or the information derived from their sequence. The microarrays were used to generate differential mRNA expression data for eosinophils isolated from different sources or under the different conditions as described above (e.g. disease and normal or with and without treatment of IL-5) or for comparison of eosinophil mRNA with mRNA isolated from other cell types.

15 Variation was normalised to allow comparison of data from different microarrays by empirical selection of invariant genes followed by normalisation across this set. Although this approach was found to provide the most reliable and accurate data a variety of alternative normalisation methods could be envisaged by the skilled man, including global normalisation across the whole array, incorporation of a known mRNA or 'spike' as an internal standard in each sample, or  
20 normalisation to a housekeeping gene or genes (e.g. GAPDH, actin).

It is apparent that the polynucleotides or fragments thereof of the second aspect of the invention may be utilised in the above described methodology, for the identification of further polynucleotides and polypeptides which play a role in eosinophil mediated disease, such as  
25 inflammatory disease.

In a third aspect, the present invention relates to polynucleotide sequences that are capable of hybridising to any of the polynucleotide sequences which encode amino-acid sequences encoded by Seq ID Nos: 1-466 or to any of Seq ID Nos: 1-466 themselves, under stringent conditions, as  
30 defined above. In a preferred embodiment of the third aspect, there is provided polynucleotide sequences which are complimentary to the polynucleotide sequences which encode amino-acid sequences encoded by Seq ID Nos: 1-466, such as sequences which are complementary to any of Seq ID Nos: 1-466.

35 Although the nucleotide sequences of the third aspect are capable of hybridising to the naturally occurring polynucleotide sequences under stringent conditions as described above, included

within the scope of the third aspect are polynucleotide sequences which hybridise to polynucleotide sequences having different codon usage, as a result of the degeneracy of the genetic code.

5 The polynucleotide sequences according to the third aspect of the invention are useful in antisense technology, for example in the modulation and/or suppression of polynucleotide expression by interfering with the proper transcription or translation of the polynucleotide sequence. This modulation and/or suppression of polynucleotide expression may be useful in abolishing or alleviating disease symptoms associated with the polynucleotide sequences. In a  
10 preferred embodiment, the third aspect relates to a method of modulating or suppressing expression of a polynucleotide sequence which encodes an amino-acid sequence encoded by any of Seq ID Nos: 1-466 or fragments of those amino acid sequences, by administering a polynucleotide sequence, or fragment thereof, which hybridises under stringent conditions to the polynucleotide sequence being expressed.

15 Such methods which suppress expression of the polynucleotide sequences may be used to elaborate on the functional properties of the polynucleotide sequences and their expression products. For example, cellular assays may be conducted in which key eosinophil responses are measured in response to normal and suppressed polynucleotide expression. The methods may  
20 also be used to abolish or alleviate the symptoms or cause of disease in a subject. In such a method, a polynucleotide sequence or fragment thereof according to the third aspect of the invention may be administered to a subject. Two distinct 'antisense' methodologies are favoured. In one preferred method polynucleotides of approximately 20 bases complementary to the mRNA coding sequence are used to disable the gene of interest. In the other preferred  
25 'antisense' methodology, the whole or a fragment of the gene sequence is inserted into an expression vector in an antisense orientation (3' to 5') under the control of a mammalian promoter and/or enhancer sequence.

For the first of the above methods, numerous techniques are available which assist in the design  
30 of suitable antisense oligonucleotides including, for example, the determination of loops in the mRNA structure using software based on thermodynamic stability calculations of the secondary and/or tertiary mRNA structures, RNase H mapping of open sites using semi-random oligonucleotides and oligonucleotides designed to bind at defined intervals along the mRNA sequence. An electronic mapping procedures based on the mFold programme may be used to  
35 generate a short list of antisense oligonucleotides. The oligonucleotides may then tested in cellular assays to select potent and specific antisense oligonucleotides that suppress expression of

polynucleotide sequences, preferably by suppressing levels of the transcribed mRNA, prior to their use in functional assays or therapeutic methods described above.

Antisense oligonucleotides can be modified in a variety of ways, including the use of methyl  
5 phosphonate, methoxy-,ethoxy- or other base modifications and phosphorothioate to increased stability, cellular uptake, mRNA affinity and decreased non-specific protein or mRNA/DNA binding affinity, whilst maintaining their ability to induce RNase H cleavage or block transcription/translation. In addition to identifying a potent and specific antisense oligonucleotide, the antisense oligonucleotide must be effectively delivered to the cell of interest.  
10 Preferably, the antisense oligonucleotide is produced by PCR techniques.

Using the second preferred 'antisense' methodology involves inserting the whole or a fragment of the polynucleotide sequence into an expression vector in an antisense orientation (3' to 5') under the control of a promoter and/or enhancer sequence. Introduction of this sequence into the cell  
15 of interest and transcription of the antisense mRNA is expected to reduce the quantity of mRNA available for translation, thus reducing the level of polypeptide expressed by the polynucleotide sequence. The antisense sequence can be introduced into a variety of different vectors (e.g. plasmid vectors, adenoviral and retroviral vectors) for delivery into cells prior to performing functional cellular assays.

20 Retroviral vectors are preferred as they have a number of advantages over the other delivery systems including ease of construction, high transduction and expression efficiencies, integration of the expression cassette into the host chromosome and the ability to deliver to both dividing and non-dividing cells). Retroviral vectors based on moloney monkey leukaemia virus (MMLV)  
25 enable delivery to a variety of dividing human cells by virtue of being pseudotyped with different envelope proteins (e.g. VSV-G and amphotrophic MLV envelope). A commercial retroviral vector system comprising murine leukemia virus (MuLV) was also used. Replication deficient vectors based on lentiviruses such as human immunodeficiency virus (HIV), feline immunodeficiency virus (FIV) or equine immunodeficiency virus (EIAV), if pseudotyped with  
30 appropriate envelope proteins, offer the potential of delivering to non-dividing or terminally differentiated cells, for example eosinophils.

In addition to the expression of antisense RNA, the retroviral vectors provide an ideal vehicle for the delivery of full length or fragments of the polynucleotide sequences in a sense orientation.  
35 Full length expression provides evidence for the role of the target, particularly relevant if it were found to be 'up' regulated in disease. Whilst expression of a fragment of the sequence could



result in the production of a dominant negative protein or provide information regarding a possible splice variant of the gene.

For both antisense methodologies and the over expression studies, it is essential that mRNA  
5 levels of the target and control polynucleotide sequences are measured accurately to ensure specificity and validity. PCR based methods are preferred because of their sensitivity of detection particularly following mRNA antisense suppression. A variety of PCR based techniques are available including gel based quantitative or semi-quantitative methods and densitometric measurement, in solution based methods using DNA intercalating fluorescent  
10 dyes or hybridisation of complementary labelled polynucleotides, the Taqman system from Perkin Elmer is preferred as this system offers good reproducibility, accuracy, real time quantitation and relatively high through put.

In a preferred embodiment of the second or third aspects of the invention, the polynucleotide  
15 sequences may be ligated to a heterologous sequence to encode a fusion protein. For example, to screen peptide libraries for inhibitors, it may be useful to encode a chimeric protein that can be recognised by a commercially available antibody. A fusion protein may also be engineered to contain a cleavage site located between the sequence encoding the peptide of interest and the heterologous protein sequence, so that the peptide of interest may be cleaved and purified away  
20 from the heterologous moiety.

The polynucleotide sequences of the second and third aspects of the invention may be operably linked to any regulatory region, *i.e.*, promoter and/or enhancer element known in the art, but these regulatory elements must be functional in the host cell selected for expression. The  
25 regulatory regions may comprise a promoter region for functional transcription in the host cell, and optionally a region situated 3' of the gene of interest, and which specifies a signal for termination of transcription and a polyadenylation site. A replication origin may also be included. Polynucleotide sequences of this embodiment may be referred to as expression cassettes. Promoters that may be used in the present invention include both constitutive  
30 promoters and regulated (inducible) promoters. The promoter may be one which naturally controls the expression of the polynucleotide sequence, or where the polynucleotide sequence is in an antisense configuration, the promoter is one which naturally controls the expression of the sense configuration of the polynucleotide sequence. When the nucleic acid does not contain a promoter sequence, an appropriate promoter sequence may be inserted.

Promoters may be from a heterologous source. In particular, they may be promoter sequences of eukaryotic or viral genes. For example, a promoter sequence may be derived from the genome of the host cell which is to be infected. Likewise, promoter sequences may be derived from the genome of a virus, such as adenovirus (E1A and MLP), cytomegalovirus, or Rous Sarcoma Virus. In addition, the promoter may be modified by addition of activating or regulatory sequences, or sequences which confer a specific expression pattern, for example tissue-specific or predominant expression (enolase and GFAP promoters etc.). Such promoters would be known to a person skilled in the art.

Suitable promoters useful for practice of this invention include ubiquitous promoters (*e.g.*, HPRT, vimentin, actin, tubulin), intermediate filament promoters (*e.g.*, desmin, neurofilaments, keratin, GFAP), therapeutic gene promoters (*e.g.*, MDR type, CFTR, factor VIII), tissue-specific promoters (*e.g.*, actin promoter in smooth muscle cells), promoters which are preferentially activated in dividing cells, promoters which respond to a stimulus (*e.g.*, steroid hormone receptor, retinoic acid receptor), tetracycline-regulated transcriptional modulators, cytomegalovirus (CMV) immediate-early, retroviral LTR, metallothionein, SV-40, adenovirus E1a, and adenovirus major late (MLP) promoters. Tetracycline-regulated transcriptional modulators and CMV promoters are described in WO 96/01313, US 5,168,062 and 5,385,839, the contents of which are incorporated herein by reference. Further preferred promoters include, but are not limited to, the SV40 early promoter region (Benoist and Chambon, 1981, *Nature* 290:304-310), the promoter contained in the 3' long terminal repeat of Rous sarcoma virus (Yamamoto, et al., 1980, *Cell* 22:787-797), the herpes thymidine kinase promoter (Wagner et al., 1981, *Proc. Natl. Acad. Sci. U.S.A.* 78:1441-1445), the regulatory sequences of the metallothionein gene (Brinster et al., 1982, *Nature* 296:39-42); prokaryotic expression vectors such as the  $\beta$ -lactamase promoter (Villa-Kamaroff, et al., 1978, *Proc. Natl. Acad. Sci. U.S.A.* 75:3727-3731), or the *tac* promoter (DeBoer, et al., 1983, *Proc. Natl. Acad. Sci. U.S.A.* 80:21-25); see also "Useful proteins from recombinant bacteria" in *Scientific American*, 1980, 242:74-94; promoter elements from yeast or other fungi such as the Gal 4 promoter, the ADC (alcohol dehydrogenase) promoter, PGK (phosphoglycerol kinase) promoter, alkaline phosphatase promoter; and the animal transcriptional control regions, which exhibit tissue specificity and have been utilized in transgenic animals: elastase I gene control region which is active in pancreatic acinar cells (Swift et al., 1984, *Cell* 38:639-646; Ornitz et al., 1986, *Cold Spring Harbor Symp. Quant. Biol.* 50:399-409; MacDonald, 1987, *Hepatology* 7:425-515); insulin gene control region which is active in pancreatic beta cells (Hanahan, 1985, *Nature* 315:115-122), immunoglobulin gene control region which is active in lymphoid cells (Grosschedl et al., 1984, *Cell* 38:647-658; Adames et al., 1985,

Nature 318:533-538; Alexander et al., 1987, Mol. Cell. Biol. 7:1436-1444), mouse mammary tumour virus control region which is active in testicular, breast, lymphoid and mast cells (Leder et al., 1986, Cell 45:485-495), albumin gene control region which is active in liver (Pinkert et al., 1987, Genes and Devel. 1:268-276), alpha-fetoprotein gene control region which is active in liver  
5 (Krumlauf et al., 1985, Mol. Cell. Biol. 5:1639-1648; Hammer et al., 1987, Science 235:53-58), alpha 1-antitrypsin gene control region which is active in the liver (Kelsey et al., 1987, Genes and Devel. 1:161-171), beta-globin gene control region which is active in myeloid cells (Mogram et al., 1985, Nature 315:338-340; Kollias et al., 1986, Cell 46:89-94), myelin basic protein gene control region which is active in oligodendrocyte cells in the brain (Readhead et al., 1987, Cell 48:703-  
10 712), myosin light chain-2 gene control region which is active in skeletal muscle (Sani, 1985, Nature 314:283-286), and gonadotropic releasing hormone gene control region which is active in the hypothalamus (Mason et al., 1986, Science 234:1372-1378).

Additional regulatory regions may be identified using the polynucleotides of the present  
15 invention. The polynucleotide sequence may be extended using various methods known in the art to detect upstream sequences such as promoters and regulatory elements. One such method which may be employed is restriction-site PCR which uses universal primers to retrieve unknown sequence adjacent to a known locus (see, e.g., Sarkar, G. (1993) PCR Methods Applic. 2:318-322). In particular, genomic DNA is first amplified in the presence of a primer which is  
20 complementary to a linker sequence within the vector and a primer specific to a region of the nucleotide sequence. The amplified sequences are then subjected to a second round of PCR with the same linker primer and another specific primer internal to the first one. Products of each round of PCR are transcribed with an appropriate RNA polymerase and sequenced using reverse transcriptase.

25 The polynucleotide sequences of the second and third aspects of the invention may also be operably linked to a 3' regulatory region, for example a 3' UTR sequence, or downstream promoter and/or enhancer sequences. Downstream 3' untranslated regions (3'UTR) have a well recognised role in mRNA stability (*Nucleic Acids Symp Ser* 1997;(36):29-32, *Microbiol Rev* 1995  
30 Sep;59(3):423-50). The stability of an mRNA plays a major role in the determination of gene expression. The stability of an mRNA reflects its structure, as well as its interaction with trans-acting RNA-binding proteins. The processes that regulate mRNA stability can effect how cells grow, differentiate, and respond to their environment, and as such represent potential sites for therapeutic intervention. The polynucleotides of the present invention may be used to identify  
35 novel 3' UTR's, which may be useful in the isolation of further full length cDNA clones, which may have a role in inflammatory disease. This may be done using standard methodologies

including: electronic extension by comparison with DNA databases, PCR based strategies such as RACE, and screening of cDNA libraries. 3' UTR's also have utility as electronic probes and can be used as probes to measure corresponding gene specific mRNA levels in cells or tissues, using a number of techniques well known in the art for example: RT-PCR, In-situ hybridisation, Northern blotting, and microarray based techniques. This may be useful in diagnostic or prognostic assays, or functional assays. Finally, such 3' UTR's may be useful in the design of antisense oligonucleotides, which have a range of utilities as discussed above.

Upstream or downstream regulatory regions of the polynucleotide sequences of the second aspect of the invention may be identified using inverse PCR, to amplify or extend sequences using divergent primers based on a known region. (See, e.g., Triglia, T. et al. (1988) *Nucleic Acids Res.* 16:8186.) The primers may be designed using commercially available software such as OLIGO 4.06 Primer Analysis software (National Biosciences Inc., Plymouth, MN) or another appropriate program to be about 22 to 30 nucleotides in length, to have a GC content of about 50% or more, and to anneal to the target sequence at temperatures of about 68°C to 72°C. The method uses several restriction enzymes to generate a suitable fragment in the known region of a gene. The fragment is then circularised by intramolecular ligation and used as a PCR template. Another method which may be used is capture PCR, which involves PCR amplification of DNA fragments adjacent to a known sequence in human and yeast artificial chromosome DNA (See, eg Lagerstrom, M. et al (1991) *PCR Methods Applic.* 1:111-119). In this method multiple restriction enzyme digestions and ligations may be used to place an engineered double-stranded sequence into an unknown fragment of the DNA molecule before performing PCR. Other methods which may be used to retrieve unknown sequences are well known in the art (see eg Parker, J.D. et al (1991) *Nucleic Acids Res.* 19:3055-3060). Additionally, one may use PCR, nested primers and PromoterFinder™ libraries to walk genomic DNA (Clontech, Palo Alto, CA). This process avoids the need to screen libraries and is useful in finding intron/exon junctions.

When screening for full-length cDNAs, it is preferable to use libraries that have been size-selected to include larger cDNAs. Also, random-primed libraries are preferable in that they will include more sequences which contain the 5' regions of genes. Use of a randomly primed library may be especially preferable for situations in which an oligo d(T) library does not yield a full-length cDNA. Genomic libraries may be useful for extension of sequence into 5' non-transcribed regulatory regions.

Capillary electrophoresis systems which are commercially available may be used to analyse the size or confirm the nucleotide sequence of sequencing or PCR products. In particular, the

capillary sequencing may employ flowable polymers for electrophoretic separation, four different fluorescent dyes (one for each nucleotide) which are laser activated, and a charge coupled device camera for detection of the emitted wavelengths. Output/light intensity may be converted to electrical signal using appropriate software (eg Genotyper™ and Sequence Navigator™, Perkin Elmer) and the entire process from loading of samples to computer analysis and electronic data display may be computer controlled. Capillary electrophoresis is especially preferable for sequencing small pieces of DNA which might be present in limited amounts in a particular sample.

- 10 In a further preferred embodiment of the second and third aspects of the present invention, the polynucleotide-sequences may be engineered using methods generally known in the art in order to alter the sequences for a variety of reasons including, but not limited to, alterations which modify the cloning, processing, and/or expression of the gene product. DNA shuffling by random fragmentation and PCR reassembly of gene fragments and synthetic oligonucleotides may be used to engineer the nucleotide sequences. For example, site-directed mutagenesis may be used to insert new restriction sites, alter glycosylation patterns, change codon preference, produce splice variants, introduce mutations, and so forth. Further, as will be understood by those of skill in the art, it may be advantageous to produce nucleotide sequences possessing non-naturally occurring codons. For example codons preferred by a particular prokaryotic or eukaryotic host can be selected to increase the rate of protein expression or to produce RNA transcript having desirable properties such as a half-life which is longer than that of a transcript generated from the naturally occurring sequence.

- In another preferred embodiment of the second and third aspects of the present invention, there is provided an expression vector comprising one or more polynucleotide sequences according to the second or third aspects of the invention. As will be apparent to a person skilled in the art, the choice of expression vector may depend upon the characteristics of the polynucleotide sequence to be expressed and the expression system used. Useful expression vectors, for example, may consist of segments of chromosomal, non-chromosomal and synthetic DNA sequences. Suitable vectors include derivatives of SV40 and known bacterial plasmids, e.g., *E. coli* plasmids col El, pCR1, pBR322, pMal-C2, pET, pGEX (Smith *et al.*, 1988, Gene 67:31-40), pMB9 and their derivatives, plasmids such as RP4; phage DNAs, e.g., the numerous derivatives of phage  $\lambda$ , e.g., NM989, and other phage DNA, e.g., M13 and filamentous single stranded phage DNA; yeast plasmids such as the 2 $\mu$  plasmid or derivatives thereof; vectors useful in eukaryotic cells, such as vectors useful in insect or mammalian cells; vectors derived from combinations of plasmids and phage DNAs, such as plasmids that have been modified to employ phage DNA or other expression control sequences; and the like.

For example, in a baculovirus expression systems, both non-fusion transfer vectors, such as but not limited to pVL941 (*Bam*H1 cloning site; Summers), pVL1393 (*Bam*H1, *Sma*I, *Xba*I, *Eco*R1, *Not*I, *Xma*III, *Bgl*II, and *Pst*I cloning site; Invitrogen), pVL1392 (*Bgl*II, *Pst*I, *Not*I, *Xma*III, *Eco*RI, *Xba*I, *Sma*I, and *Bam*H1 cloning site; Summers and Invitrogen), and pBlueBacIII (*Bam*H1, *Bgl*II, *Pst*I, *Nco*I, and *Hind*III cloning site, with blue/white recombinant screening possible; Invitrogen), and fusion transfer vectors, such as but not limited to pAc700 (*Bam*H1 and *Kpn*I cloning site, in which the *Bam*H1 recognition site begins with the initiation codon; Summers), pAc701 and pAc702 (same as pAc700, with different reading frames), pAc360 (*Bam*H1 cloning site 36 base pairs downstream of a polyhedrin initiation codon; Invitrogen(195)), and pBlueBacHisA, B, C (three different reading frames, with *Bam*H1, *Bgl*II, *Pst*I, *Nco*I, and *Hind*III cloning site, an N-terminal peptide for ProBond purification, and blue/white recombinant screening of plaques; Invitrogen (220)) can be used.

Mammalian expression vectors contemplated for use in the invention include vectors with inducible promoters, such as the dihydrofolate reductase (DHFR) promoter, *e.g.*, any expression vector with a *DHFR* expression vector, or a *DHFR*/methotrexate co-amplification vector, such as pED (*Pst*I, *Sal*I, *Sba*I, *Sma*I, and *Eco*RI cloning site, with the vector expressing both the cloned gene and *DHFR*; *see* Kaufman, *Current Protocols in Molecular Biology*, 16.12 (1991). Alternatively, a glutamine synthetase/methionine sulfoximine co-amplification vector, such as pEE14 (*Hind*III, *Xba*I, *Sma*I, *Sba*I, *Eco*RI, and *Bcl*I cloning site, in which the vector expresses glutamine synthase and the cloned gene; Celltech). In another embodiment, a vector that directs episomal expression under control of Epstein Barr Virus (EBV) can be used, such as pREP4 (*Bam*H1, *Sfi*I, *Xho*I, *Not*I, *Nhe*I, *Hind*III, *Nhe*I, *Pvu*II, and *Kpn*I cloning site, constitutive Rous Sarcoma Virus Long Terminal Repeat (RSV-LTR) promoter, hygromycin selectable marker; Invitrogen), pCEP4 (*Bam*H1, *Sfi*I, *Xho*I, *Not*I, *Nhe*I, *Hind*III, *Nhe*I, *Pvu*II, and *Kpn*I cloning site, constitutive human cytomegalovirus (hCMV) immediate early gene, hygromycin selectable marker; Invitrogen), pMEP4 (*Kpn*I, *Pvu*I, *Nhe*I, *Hind*III, *Not*I, *Xho*I, *Sfi*I, *Bam*H1 cloning site, inducible methallothionein IIa gene promoter, hygromycin selectable marker; Invitrogen), pREP8 (*Bam*H1, *Xho*I, *Not*I, *Hind*III, *Nhe*I, and *Kpn*I cloning site, RSV-LTR promoter, histidinol selectable marker; Invitrogen), pREP9 (*Kpn*I, *Nhe*I, *Hind*III, *Not*I, *Xho*I, *Sfi*I, and *Bam*H1 cloning site, RSV-LTR promoter, G418 selectable marker; Invitrogen), and pEBVHis (RSV-LTR promoter, hygromycin selectable marker, N-terminal peptide purifiable via ProBond resin and cleaved by enterokinase; Invitrogen). Selectable mammalian expression vectors for use in the invention include pRc/CMV (*Hind*III, *Bst*XI, *Not*I, *Sba*I, and *Apa*I cloning site, G418 selection; Invitrogen), pRc/RSV (*Hind*III, *Spe*I, *Bst*XI, *Not*I, *Xba*I cloning site, G418 selection; Invitrogen),

and others. Vaccinia virus mammalian expression vectors (*see*, Kaufman, 1991, *supra*) for use according to the invention include but are not limited to pSC11 (*Sma*I cloning site, TK- and  $\beta$ -gal selection), pMJ601 (*Sal*I, *Sma*I, *Afl*I, *Nar*I, *Bsp*MII, *Bam*HI, *Apa*I, *Nhe*I, *Sac*II, *Kpn*I, and *Hind*III cloning site; TK- and  $\beta$ -gal selection), and pTKgptF1S (*Eco*RI, *Pst*I, *Sal*I, *Acc*I, *Hind*II, *Sba*I, *Bam*HI, and *Hpa* cloning site, TK or XPRT selection).

In another preferred embodiment, there are provided host cells comprising the polypeptide or polynucleotide sequences according to the first, second or third aspects of the invention. Preferably, a host cell is provided as an expression system, and thus may comprise a polynucleotide sequence or fragment thereof according to the second or third aspects of the invention. More preferably, the host cell will comprise an expression vector, such as described above, which comprises the polynucleotide sequence or fragment thereof. Suitable host cell strains or cell-free expression systems will be known to persons skilled in the art.

A host cell strain may be chosen which modulates the expression of the inserted sequences, or modifies and processes the gene product in the specific fashion desired. Different host cells have characteristic and specific mechanisms for the translational and post-translational processing and modification of proteins. Appropriate cell lines or host systems can be chosen to ensure the desired modification and processing of the foreign protein expressed. Expression in yeast can produce a biologically active product. Expression in eukaryotic cells can increase the likelihood of "native" folding. Moreover, expression in mammalian cells can provide a tool for reconstituting, or constituting, polypeptide activity. Furthermore, different vector/host expression systems may affect processing reactions, such as proteolytic cleavages, to a different extent.

In a fourth aspect, the present invention relates to the production of the polynucleotide or polypeptide sequences, or fragments or variants thereof, according to the first, second or third aspects of the invention. The production of a polynucleotide or polypeptide sequence may comprise either recombinant or synthetic techniques. Where the method comprises production of the polypeptide or polynucleotide sequence by synthetic chemistry, preferably the entire polypeptide or or polynucleotide sequence, or desired fragment thereof is made using synthetic chemistry. Where a polynucleotide is produced, the synthetic sequence may be inserted into any expression vectors, such as those described above, and expressed in a expression system using reagents that are well known in the art. Moreover synthetic chemistry may be used to introduce modifications and/or mutations into an oligonucleotide sequence or a fragment thereof.

The polynucleotide sequences may be synthesised, in whole or in part, using chemical methods well known in the art. (See, e.g., Caruthers, M.H. et al. (1980) Nucl. Acids Res. Symp. Ser. 215-223, and Horn, T. et al. (1980) Nuc.l. Acids Res. Symp. Ser. 225-232). Alternatively, the polypeptide may be produced using chemical methods to synthesize the amino acid sequence of any one or more of Figure 1 to 357, or a fragment thereof. For example, peptide synthesis can be performed using various solid-phase techniques. (See, e.g., Roberge, J.Y. et al. (1995) Science 269:202-204). Automated synthesis may be achieved using the ABI 43 IA Peptide Synthesizer (Perkin Elmer). Additionally, the amino acid sequence, or any part thereof, may be altered during direct synthesis and/or combined with sequences from other proteins, or any part thereof, to produce a variant polypeptide. The polypeptide may be substantially purified by preparative high performance liquid analysis or by sequencing. (See for example: Creighton, T. (1983) Proteins. Structures and Molecular Properties, WH Freeman and Co., New York).

In a preferred embodiment of the fourth aspect of the invention, there is provided a method for directing the expression of the polypeptide sequences or fragments thereof of the first aspect of the invention in appropriate host cells. Preferably, this method employs recombinant DNA technology to result in expression of polypeptides according to the first aspect of the invention. The method of producing a polypeptide according to the first aspect of the invention, comprises:

- a) transforming a host cell with a polynucleotide sequence according to the second or third aspects of the invention;
- b) culturing the host cell under conditions suitable for expression of the polypeptide; and
- c) recovering the polypeptide from the host cell culture.

The polynucleotide sequence introduced into the host cell may be in the form of an expression vector, having the necessary regulatory sequences such as promoters and/or enhancers, and transcriptional and translational signals, as discussed above. The polynucleotide sequence may be flanked by its' native upstream and/or downstream regulatory regions. Potential host-vector systems include but are not limited to mammalian cell systems infected with virus (e.g., vaccinia virus, adenovirus, etc.); insect cell systems infected with virus (e.g., baculovirus); microorganisms such as yeast containing yeast vectors; or bacteria transformed with bacteriophage, DNA, plasmid DNA, or cosmid DNA. The expression elements of vectors vary in their strengths and specificities. Depending on the host-vector system utilised, any one of a number of suitable transcription and translation elements may be used. Yeast expression systems can also be used to express polypeptides of the present invention. For example, the non-fusion pYES2 vector (*Xba*I, *Sph*I, *Sho*I, *Not*I, *Gst*XI, *Eco*RI, *Bst*XI, *Bam*H1, *Sac*I, *Kpn*1, and *Hind*III cloning sit; Invitrogen) or the fusion pYESHisA, B, C (*Xba*I, *Sph*I, *Sho*I, *Not*I, *Bst*XI, *Eco*RI,



*Bam*HI, *Sac*I, *Kpn*I, and *Hind*III cloning site, N-terminal peptide purified with ProBond resin and cleaved with enterokinase; Invitrogen), to mention just two, can be employed according to the invention.

5 Alternatively, the polynucleotide sequence of the invention or fragment thereof, may be expressed chromosomally, after integration of the coding sequence by recombination. In this regard, any of a number of amplification systems may be used to achieve high levels of stable gene expression (See Sambrook et al., 1989, *supra*). Any method for the insertion of DNA fragments into a cloning vector may be used to construct expression vectors containing a gene  
10 consisting of appropriate transcriptional/translational control signals and the protein coding sequences. These methods may include *in vitro* recombinant DNA and synthetic techniques and *in vivo* recombination (genetic recombination). Such methods will be known to a person skilled in the art.

15 Vectors are introduced into the desired host cells by methods known in the art, e.g., transfection, electroporation, microinjection, transduction, cell fusion, DEAE dextran, calcium phosphate precipitation, lipofection (lysosome fusion), use of a gene gun, or a DNA vector transporter (see, e.g., Wu et al., 1992, J. Biol. Chem. 267:963-967; Wu and Wu, 1988, J. Biol. Chem. 263:14621-14624; Hartmut et al., Canadian Patent Application No. 2,012,311, filed March 15, 1990).

20 Expression vectors containing a polynucleotide of the invention can be identified by five general approaches: (a) PCR amplification of the desired plasmid DNA or specific mRNA, (b) nucleic acid hybridization, (c) presence or absence of selection marker gene functions, (d) analysis with appropriate restriction endonucleases, and (e) expression of inserted sequences. In the first  
25 approach, the nucleic acids can be amplified by PCR to provide for detection of the amplified product. In the second approach, the presence of a foreign gene inserted in an expression vector can be detected by nucleic acid hybridization using probes comprising sequences that are homologous to an inserted marker gene. In the third approach, the recombinant vector/host system can be identified and selected based upon the presence or absence of certain "selection  
30 marker" gene functions (e.g.,  $\beta$ -galactosidase activity, thymidine kinase activity, resistance to antibiotics, transformation phenotype, occlusion body formation in baculovirus, etc.) caused by the insertion of foreign genes in the vector. In another example, if a polynucleotide sequence of the invention is inserted within a "selection marker" gene sequence of the vector. Recombinants containing an insert can then be identified by the absence of the gene function. In the fourth  
35 approach, recombinant expression vectors are identified by digestion with appropriate restriction enzymes. In the fifth approach, recombinant expression vectors can be identified by

assaying for the activity, biochemical, or immunological characteristics of the gene product expressed by the recombinant, provided that the expressed protein assumes a functionally active conformation.

- 5 Once a particular recombinant DNA molecule is identified and isolated, several methods known in the art may be used to propagate it. Once a suitable host system and growth conditions are established, recombinant expression vectors can be propagated and prepared in quantity.

10 Soluble forms of the protein can be obtained by collecting culture fluid, or solubilising inclusion bodies, *e.g.*, by treatment with detergent, and if desired sonication or other mechanical processes, as described above. The solubilised or soluble protein can be isolated using various techniques, such as polyacrylamide gel electrophoresis (PAGE), isoelectric focusing, 2-dimensional gel electrophoresis, chromatography (*e.g.*, ion exchange, affinity, immunoaffinity, and sizing column chromatography), centrifugation, differential solubility, immunoprecipitation, or by any other  
15 standard technique for the purification of proteins.

In accordance with the present invention there may be employed conventional molecular biology, microbiology, and recombinant DNA techniques within the skill of the art. Such techniques are explained fully in the literature. See, *e.g.*, Sambrook, Fritsch & Maniatis, *Molecular Cloning: A Laboratory Manual*, Second Edition (1989) Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York ; *DNA Cloning: A Practical Approach*, Volumes I and II (D.N. Glover ed. 1985); *Oligonucleotide Synthesis* (M.J. Gait ed. 1984); *Nucleic Acid Hybridization* [B.D. Hames & S.J. Higgins eds. (1985)]; *Transcription And Translation* [B.D. Hames & S.J. Higgins, eds. (1984)]; *Animal Cell Culture* [R.I. Freshney, ed. (1986)]; *Immobilized Cells And Enzymes* [IRL Press, (1986)]; B. Perbal, *A Practical Guide To Molecular Cloning* (1984); F.M. Ausubel et al. (eds.), *Current Protocols in Molecular Biology*, John Wiley & Sons, Inc. (1994).  
25

Methods for DNA sequencing are well known and generally available in the art and may be used to practice any of the embodiments of the invention. The methods may employ such enzymes as the Klenow fragment of DNA polymerase I, <sup>TM</sup> (US Biochemical Corp., Cleveland, OH), Taq polymerase (Perkin Elmer), thermostable T7 polymerase (Amersham, Chicago, IL), or combinations of polymerases and proof reading exonucleases such as those found in the ELONGASE Amplification System (GIBCO/BRL, Gaithersburg, MD). Preferably, the process is automated with machines.  
30

In a fifth aspect of the invention, there is provided an antibody or fragment thereof which binds to a polypeptide according to the first aspect of the invention. Also provided are methods for production of such antibodies or fragments thereof, using the polypeptides, or fragments thereof, of the first aspect as antigens. Fusion proteins as described above may also be used for the generation of antibodies.

A molecule is "antigenic" when it is capable of specifically interacting with an antigen recognition molecule of the immune system, such as an immunoglobulin (antibody) or T cell antigen receptor. An antigenic polypeptide contains at least about 5, and preferably at least about 10, amino acids. An antigenic portion of a molecule can be that portion that is immunodominant for antibody or T cell receptor recognition, or it can be a portion used to generate an antibody to the molecule by conjugating the antigenic portion to a carrier molecule for immunisation. A molecule that is antigenic need not be itself immunogenic, *i.e.*, capable of eliciting an immune response without a carrier.

The antibodies of the fifth aspect include but are not limited to polyclonal, monoclonal, chimeric, single chain, Fab fragments, and an Fab expression library. The antibodies of the invention may be cross reactive, *ie* they may recognise different antigenic species. Polyclonal antibodies have greater likelihood of cross reactivity. Alternatively, an antibody of the invention may be specific for a single polypeptide. Preferably, such an antibody is specific for the polypeptides of the invention.

Various procedures known in the art may be used for the production of polyclonal antibodies. For the production of antibody, various host animals can be immunised by injection with a polypeptide of the invention, or a derivative (*e.g.*, fragment or fusion protein) thereof, including but not limited to rabbits, mice, rats, sheep, goats, etc. In one embodiment, a polypeptide or fragment thereof can be conjugated to an immunogenic carrier, *e.g.*, bovine serum albumin (BSA) or keyhole limpet hemocyanin (KLH). Various adjuvants may be used to increase the immunological response, depending on the host species, including but not limited to Freund's (complete and incomplete), mineral gels such as aluminium hydroxide, surface active substances such as -lysolecithin, pluronic polyols, polyanions, peptides, oil emulsions, keyhole limpet hemocyanins, dinitrophenol. Among adjuvants used in humans, BCG (bacilli Calmette-Guerin) and 5 Colynebacte arvum are especially preferable. It is preferred that the polypeptides, or fragments used to induce antibodies have an amino acid sequence consisting of at least about 5 amino acids, and, more preferably, of at least about 10 amino acids. It is also preferable that these polypeptides, or fragments are identical to a portion of the amino acid sequence of the

natural protein. Short stretches of amino acids may be fused with those of another protein, such as KLH and antibodies to the chimeric molecule may be produced.

5 Monoclonal antibodies directed towards a polypeptide of the invention, or fragment, or analog, or derivative thereof may be prepared using any technique which provides for the production of antibody molecules by continuous cell lines in culture. These include, but are not limited to the hybridoma technique originally developed by Kohler and Milstein [*Nature* 256:495-497 (1975)], as well as the trioma technique, the human B-cell hybridoma technique [Kozbor et al., *Immunology Today* 4:72 (1983); Cote et al., *Proc. Natl. Acad. Sci. U.S.A.* 80:2026-2030 (1983)], and  
10 the EBV-hybridoma technique to produce human monoclonal antibodies [Cole et al., in *Monoclonal Antibodies and Cancer Therapy*, Alan R. Liss, Inc., pp. 77-96 (1985)].

In another embodiment of the fifth aspect, monoclonal antibodies can be produced in germ-free animals [International Patent Publication No. WO 89/12690, published 28 December 1989].

15 Techniques developed for the production of "chimeric antibodies" such as [Morrison et al., *J. Bacteriol.* 159:870 (1984); Neuberger et al., *Nature* 312:604-608 (1984); Takeda et al., *Nature* 314:452-454 (1985)] by splicing the genes from a mouse antibody molecule specific for a polypeptide of the invention together with genes from a human antibody molecule of appropriate  
20 biological activity can also be used; and such antibodies are within the scope of this invention. Such human or humanized chimeric antibodies are preferred for use in therapy of human diseases or disorders (described *infra*), since the human or humanized antibodies are much less likely than xenogenic antibodies to induce an immune response, in particular an allergic response, themselves.

25 According to the invention, techniques described for the production of single chain Fv (scFv) antibodies [U.S. Patent Nos. 5,476,786 and 5,132,405 to Huston; U.S. Patent 4,946,778] can be adapted to produce polypeptide-specific single chain antibodies.

30 An additional embodiment of the invention utilises the techniques described for the construction of Fab expression libraries Huse et al., *Science* 246:1275-1281 (1989) to allow rapid and easy identification of monoclonal Fab fragments with the desired specificity for a polypeptide of the invention, or its derivatives, or analogs. Antibody fragments which contain the idiotype of the antibody molecule can be generated by known techniques. For example, such fragments include  
35 but are not limited to: the F(ab')<sub>2</sub> fragment which can be produced by pepsin digestion of the antibody molecule; the Fab' fragments which can be generated by reducing the disulfide bridges

of the F(ab')<sub>2</sub> fragment, and the Fab fragments which can be generated by treating the antibody molecule with papain and a reducing agent.

5 In the production of antibodies, screening for the desired antibody can be accomplished by techniques known in the art, *e.g.*, radioimmunoassay, ELISA (enzyme-linked immunosorbent assay), "sandwich" immunoassays, immunoradiometric assays, gel diffusion precipitin reactions, immunodiffusion assays, *in situ* immunoassays (using colloidal gold, enzyme or radioisotope labels, for example), western blots, precipitation reactions, agglutination assays (*e.g.*, gel agglutination assays, hemagglutination assays), complement fixation assays, immunofluorescence  
10 assays, protein A assays, and immunoelectrophoresis assays, etc. In one embodiment, antibody binding is detected by detecting a label on the primary antibody. In another embodiment, the primary antibody is detected by detecting binding of a secondary antibody or reagent to the primary antibody. In a further embodiment, the secondary antibody is labelled. Many means are known in the art for detecting binding in an immunoassay and are within the scope of the  
15 present invention. For example, to select antibodies which recognise a specific epitope of a polypeptide of the present invention, one may assay generated hybridomas for a product which binds to an polypeptide fragment containing such epitope. For selection of an antibody specific to a polypeptide from a particular species of animal, one can select on the basis of positive binding with polypeptide expressed by or isolated from cells of that species of animal.

20

The foregoing antibodies can be used in methods known in the art relating to the localisation and activity of the polypeptides of the present invention, *e.g.*, for Western blotting, imaging polypeptide *in situ*, measuring levels thereof in appropriate physiological samples, etc. using any of the detection techniques mentioned above or known in the art.

25

In a specific embodiment, antibodies that agonize or antagonize the activity of a polypeptide can be generated. Such antibodies can be tested using the assays described *infra* for identifying ligands. In particular, such antibodies can be scFv antibodies expressed intracellularly.

30 Histological analysis using these antibodies of the present invention can provide information on protein tissue distribution (disease and normal tissue), localisation of the protein within cells and the extracellular environment. The antibodies of the present invention can also provide functional information by acting as agonists or antagonists of the protein encoded by the novel gene in question both *in vitro* and *in vivo*.

In a sixth aspect, the present invention relates to a method of screening for agents which modify the expression and/or activity of one or more of the polynucleotides or polypeptides of the present invention, or derivatives thereof, the method comprising the steps of:

- 5 a) exposing one or more of the polynucleotides or polypeptides or derivatives thereof to at least one agent to be screened; and
  - b) detecting and/or measuring interaction and/or binding between the polynucleotide or polypeptide or derivatives thereof and the agent.
- 10 Preferably, the polynucleotides are those of the second or third aspect of the invention, more preferably the polynucleotide sequences of any of Seq ID Nos: 1-466, or fragments thereof. The polypeptide sequences are preferably those encoded by any of Seq ID Nos: 1-466, or fragments thereof.
- 15 The polypeptides or polynucleotides of the present invention, or derivatives thereof including catalytic or immunogenic fragments, or oligopeptides can be used for screening libraries of compounds in any of a variety of drug screening techniques. The polypeptides or polynucleotides of the present invention, or derivatives thereof employed in such screening may be free in solution, affixed to a solid support, borne on a cell surface, or located intracellularly.
- 20 The formation of binding complexes between the polypeptides or polynucleotides of the present invention, or derivatives thereof and the agent being tested may be measured.

Another technique for drug screening provides for high throughput screening of compounds having suitable binding affinity to a polypeptide of interest. (See, e.g., Geysen, et al. (1984) PCT application W084103564). In this method, large numbers of different small test compounds are synthesised on a solid substrate, such as plastic pins or some other surface. The test compounds are reacted with a polypeptide of the present invention, or one or more fragments thereof, and washed. Bound polypeptide is then detected by methods well known in the art. Purified polypeptide can also be coated directly onto plates for use in the aforementioned drug screening techniques. Alternatively, non-neutralising antibodies can be used to capture the peptide and immobilise it on a solid support.

Identification and isolation of a polynucleotide encoding a polypeptide of the invention provides for expression of polypeptides in quantities greater than can be isolated from natural sources, or in indicator cells that are specially engineered to indicate the activity of a polypeptide expressed after transfection or transformation of the cells. Accordingly, in addition to rational design of agonists and antagonists based on the structure of a polypeptide, the present invention

contemplates an alternative method for identifying specific ligands of polypeptides of the invention using various screening assays known in the art.

Any screening technique known in the art can be used to screen for agents which either agonise or antagonise the polypeptides of the present invention. For example, a suitable cell line expressing a polypeptide of the invention, can be transfected with a nucleic acid encoding a marker gene, such as  $\beta$ -galactosidase. Cells are then exposed to a test solution comprising a putative agonist or antagonist, and then stained for  $\beta$ -galactosidase activity. The presence of more  $\beta$ -gal positive cells relative to control cells not exposed to the test solution is an indication of the presence of an agonist of the polypeptide in the test solution. Conversely, the presence of less  $\beta$ -gal positive cells relative to control cells not exposed to the test solution is an indication of the presence of an antagonist of the polypeptide in the test solution.

The present invention contemplates screens for small molecule ligands or ligand analogs and mimics, as well as screens for natural ligands that bind to and agonise or antagonise the polypeptides or polynucleotides of the present invention *in vivo*.

Knowledge of the primary sequence of a polynucleotide or polypeptide of the invention, and the similarity of that sequence with sequences of known function, can provide an indication of potential inhibitors or antagonists of a protein or polynucleotide. Identification and screening of antagonists is further facilitated by determining structural features of the polynucleotide or polypeptide, *e.g.*, using X-ray crystallography, neutron diffraction, nuclear magnetic resonance spectrometry, and other techniques for structure determination. These techniques provide for the rational design or identification of agonists and antagonists.

Another approach uses recombinant bacteriophage to produce large libraries. Using the "phage method" [Scott and Smith, 1990, *Science* 249:386-390 (1990); Cwirla, et al., *Proc. Natl. Acad. Sci.*, 87:6378-6382 (1990); Devlin et al., *Science*, 249:404-406 (1990)], very large libraries can be constructed ( $10^6$ - $10^8$  chemical entities). A second approach uses primarily chemical methods, of which the Geysen method [Geysen et al., *Molecular Immunology* 23:709-715 (1986); Geysen et al. *J. Immunologic Method* 102:259-274 (1987)] and the method of Fodor et al. [*Science* 251:767-773 (1991)] are examples. Furka et al. [*14th International Congress of Biochemistry, Volume 5*, Abstract FR:013 (1988); Furka, *Int. J. Peptide Protein Res.* 37:487-493 (1991)], Houghton [U.S. Patent No. 4,631,211, issued December 1986] and Rutter et al. [U.S. Patent No. 5,010,175, issued April 23, 1991] describe methods to produce a mixture of peptides that can be tested as agonists or antagonists.

In another embodiment, synthetic libraries [Needels et al., *Proc. Natl. Acad. Sci. USA* 90:10700-4 (1993); Ohlmeyer et al., *Proc. Natl. Acad. Sci. USA* 90:10922-10926 (1993); Lam et al., International Patent Publication No. WO 92/00252; Kocis et al., International Patent Publication  
5 No. WO 9428028, each of which is incorporated herein by reference in its entirety], and the like can be used to screen for ligands according to the present invention.

The screening can be performed with recombinant cells that express a polypeptide of the invention, or alternatively, using purified protein, *e.g.*, produced recombinantly, as described  
10 above. For example, labelled, soluble peptides can be used to screen libraries, as described in the foregoing references.

In an embodiment, a polypeptide or polynucleotide or derivative thereof may be directly labelled. In another aspect of the invention a labelled secondary reagent may be used to detect  
15 binding of the polynucleotide or polypeptide or derivative thereof to an agent of interest, *e.g.*, a molecule attached to a solid phase support. Binding may be detected by *in situ* formation of a chromophore by an enzyme label. Suitable enzymes include, but are not limited to, alkaline phosphatase and horseradish peroxidase. In a further embodiment, a two colour assay, using two chromogenic substrates with two enzyme labels on different acceptor molecules of interest,  
20 may be used. Cross-reactive and singly-reactive ligands may be identified with a two-colour assay.

Other labels for use in the invention include coloured latex beads, magnetic beads, fluorescent labels (*e.g.*, fluoresceine isothiocyanate (FITC), phycoerythrin (PE), Texas red (TR), rhodamine,  
25 free or chelated lanthanide series salts, especially  $\text{Eu}^{3+}$ , to name a few fluorophores), chemiluminescent molecules, radio-isotopes, or magnetic resonance imaging labels. Two colour assays may be performed with two or more coloured latex beads, or fluorophores that emit at different wavelengths. Labelled moieties may be detected visually or by mechanical/optical means. Mechanical/optical means include fluorescence activated sorting, *i.e.*, analogous to  
30 FACS, and micromanipulator removal means.

In another embodiment, one may use competitive drug screening assays in which neutralising antibodies capable of binding the polypeptide specifically compete with a test compound for binding sites. In this manner, antibodies can be used to detect the presence of any peptide which  
35 shares one or more antigenic determinants with a polypeptide of the present invention.



In a related aspect, the present invention relates to agents identified using the above screening method of the sixth aspect.

5 In a seventh aspect, the present invention also relates to pharmaceutical compositions. In one embodiment a polypeptide, polynucleotide, fragment thereof, antisense polynucleotide sequence, antibody or agent of the present invention, with or without a pharmaceutically acceptable carrier or vehicle may be administered to a subject for use in the diagnosis, prevention or treatment of disease, such as eosinophil mediated inflammatory disease. Such a disease may include, but is not limited to, asthma, emphysema, COPD, bronchitis, allergic disorders such as  
10 atopic dermatitis and NERDS (nodules eosinophilia, rheumatism, dermatitis and swelling); vasculitic granulomatous diseases including polyarteritis, Wegeners granulomatosis; some auto-immune diseases; interstitial and other pulmonary diseases including eosinophilic pneumonia, sarcoiditis and idiopathic pulmonary fibrosis; and neoplastic and myoproliferative diseases including hypereosinophilic syndrome, T cell lymphoma and hodgkins disease.

15 In a preferred embodiment, the pharmaceutical composition may comprise an antagonist of the polypeptides of the present invention for administration to a subject to treat or prevent an eosinophil mediated disorder. Such a disorder may include inflammatory disorders of any type, and includes but is not limited to, asthma, emphysema, COPD, bronchitis, allergic disorders  
20 such as atopic dermatitis and NERDS (nodules eosinophilia, rheumatism, dermatitis and swelling); vasculitic granulomatous diseases including polyarteritis, Wegeners granulomatosis; some auto-immune diseases; interstitial and other pulmonary diseases including eosinophilic pneumonia, sarcoiditis and idiopathic pulmonary fibrosis; and neoplastic and myoproliferative diseases including hypereosinophilic syndrome, T cell lymphoma and hodgkins disease.

25 In another embodiment, the pharmaceutical composition may comprise an antibody which specifically binds a polypeptide of the present invention, for use directly as an antagonist as described above, or indirectly as a targeting or delivery mechanism for bringing a pharmaceutical agent to cells or tissue which express the polypeptide.

30 In an additional embodiment, the pharmaceutical composition may comprise the complement of a polynucleotide of the second aspect, for administration to a subject to treat or prevent an inflammatory disease including, but not limited to, those described above. Preferably, a polynucleotide sequence according to the third aspect of the invention will be used. More  
35 preferably, the polynucleotide sequence will be in the form of an expression vector, as described above.

In an additional embodiment, the pharmaceutical composition may comprise the polynucleotide or polypeptide sequences, or fragments thereof, of the first and second aspects of the invention for use in treating or preventing an inflammatory disease, preferably an eosinophil mediated

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In further embodiments, any of the polypeptides, antagonists, antibodies, agonists, complementary sequences, or vectors of the invention may be administered in combination with other appropriate therapeutic agents. Selection of the appropriate agents for use in combination therapy may be made by one of ordinary skill in the art, according to conventional  
10 pharmaceutical principles. The combination of therapeutic agents may act synergistically to effect the treatment or prevention of the various disorders described above. Using this approach, one may be able to achieve therapeutic efficacy with lower dosages of each agent, thus reducing the potential for adverse side effects.

15 An antagonist of a polypeptide of the present invention may be produced using methods which are generally known in the art. In particular, purified polypeptide may be used to produce antibodies or to screen libraries of pharmaceutical agents to identify those which specifically bind to the polypeptide. Antibodies to a polypeptide of the invention may also be generated using methods that are well known in the art examples of which are described *supra*. Such  
20 antibodies may include, but are not limited to, polyclonal, monoclonal, chimeric, and single chain antibodies, Fab fragments, and fragments produced by a Fab expression library. Neutralising antibodies (i.e., those which inhibit dimer formation) are especially preferred for therapeutic use.

25 In an eighth aspect of the invention, there is provided a method of prevention, or treatment of an inflammatory disease, in particular eosinophil mediated disease, comprising administration to a subject a polynucleotide or polypeptide or fragment thereof, or derivatives including complements, antibodies or agents. In one embodiment, a complement of a polynucleotide may be used in diagnosis, prevention or treatment of disease, for example in situations in which it  
30 would be desirable to block the transcription of the mRNA. In particular, cells may be transformed with sequences complementary to the polynucleotide of the present invention. Thus, complementary molecules or fragments may be used to modulate polypeptide activity, or to achieve regulation of gene function. Such technology is now well known in the art, and sense or antisense oligonucleotides or larger fragments can be designed from various locations along  
35 the coding or control regions of sequences. Preferably, polynucleotide sequences according to the third aspect of the invention will be employed.

In an embodiment of this aspect, it is envisaged that the polynucleotide sequences of the second aspect of the invention may be used in the treatment or prevention of an inflammatory disease, in particular, and eosinophil mediated disease. For example, a polynucleotide sequence according to the second aspect may be administered to a subject by any method described below where it is found that disease or symptoms thereof are the result of a deficiency in a particular polynucleotide or polypeptide sequence. In an embodiment, the method may comprise direct administration of the polypeptide sequences according to the first aspect.

Expression vectors derived from retroviruses, adenoviruses, or herpes or vaccinia viruses, or from various bacterial plasmids, may be used for delivery of nucleotide sequences to the targeted organ, tissue, or cell population. Methods which are well known to those skilled in the art can be used to construct vectors which will express nucleic acid sequences complementary to the polynucleotides of the present invention (See, e.g., Sambrook, *supra*; and Ausubel, *supra*.)

Genes can be turned off by transforming a cell or tissue with expression vectors which express high levels of a polynucleotide, or a fragment thereof. Such constructs may be used to introduce untranslatable sense or antisense sequences into a cell. Even in the absence of integration into the DNA, such vectors may continue to transcribe RNA molecules until they are disabled by endogenous nucleases. Transient expression may last for a month or more with a non-replicating vector, and may last even longer if appropriate replication elements are part of the vector system.

As mentioned above, modifications of gene expression can be obtained by designing complementary sequences or antisense molecules (DNA, RNA, or PNA) to the control, 5', or regulatory regions of the polynucleotides of the present invention. Oligonucleotides derived from the transcription initiation site, e.g., between about positions -10 and +10 from the start site, are preferred. Similarly, inhibition can be achieved using triple helix base-pairing methodology. Triple helix pairing is useful because it causes inhibition of the ability of the double helix to open sufficiently for the binding of polymerases, transcription factors, or regulatory molecules. Recent therapeutic advances using triplex DNA have been described in the literature. (See, e.g., Gee, J.E. et al. (1994) in Huber, B.E. and B.I. Carr, Molecular and Immunologic A1212roaches, Futura Publishing Co., Mt. Kisco, NY, pp. 163-177.) A complementary sequence or antisense molecule may also be designed to block translation of mRNA by preventing the transcript from binding to ribosomes.

Ribozymes, enzymatic RNA molecules, may also be used to catalyse the specific cleavage of RNA. The mechanism of ribozyme action involves sequence-specific hybridization of the ribozyme molecule to complementary target RNA, followed by endonucleolytic cleavage. For example, engineered hammerhead motif ribozyme molecules may specifically and efficiently catalyse endonucleolytic cleavage of polynucleotide sequences. Specific ribozyme cleavage sites within any potential RNA target are initially identified by scanning the target molecule for ribozyme cleavage sites, including the following sequences: GUA, GUU, and GUC. Once identified, short RNA sequences of between 15 and 20 ribonucleotides, corresponding to the region of the target containing the cleavage site, may be evaluated for secondary structural features which may render the oligonucleotide inoperable. The suitability of candidate targets may also be evaluated by testing accessibility to hybridization with complementary oligonucleotides using ribonuclease protection assays.

Complementary ribonucleic acid molecules and ribozymes of the invention may be prepared by any method known in the art for the synthesis of nucleic acid molecules. These include techniques for chemically synthesising oligonucleotides such as solid phase phosphoramidite chemical synthesis. Alternatively, RNA molecules may be generated by in vitro and in vivo transcription of DNA sequences. Such DNA sequences may be incorporated into a wide variety of vectors with suitable RNA polymerase promoters such as T7 or SP6. Alternatively, these cDNA constructs that synthesise complementary RNA, constitutively or inducibly, can be introduced into cell lines, cells, or tissues.

RNA molecules may be modified to increase intracellular stability and half-life. Possible modifications include, but are not limited to, the addition of flanking sequences at the 5' and/or 3' ends of the molecule, or the use of phosphorothioate or 2'O-methyl rather than phosphodiesterase linkages within the backbone of the molecule. This concept is inherent in the production of PNAs and can be extended in all of these molecules by the inclusion of nontraditional bases such as inosine, queosine, and wybutosine, as well as acetyl-, methyl-, thio-, and similarly modified forms of adenine, cytidine, guanine, thymine, and uridine which are not as easily recognised by endogenous endonucleases.

Many methods for introducing vectors into cells or tissues are available and are equally suitable for use, in vivo, in vitro, and ex vivo. For ex vivo therapy, vectors may be introduced into stem cells taken from a patient and clonally propagated for autologous transplant back into that same patient. Delivery by transfection, by liposome injections, or by polycationic amino polymers may

be achieved using methods which are well known in the art. (See, e.g., Goldman, C.K. et al. (1997) *Nature Biotechnology* 15:462-466.)

5 A further embodiment of the present aspect relates to the administration of a pharmaceutical or sterile agent, preferably in conjunction with a pharmaceutically acceptable carrier, for use in a method of prevention or treatment of an inflammatory disease, in particular an eosinophil mediated disease. Such pharmaceutical compositions may consist of polynucleotide, polypeptide, fragments thereof, antibodies, and mimetics, agonists, antagonists, or inhibitors. The compositions may be administered alone or in combination with at least one other agent, drug, or  
10 hormone, such as a stabilising compound, which may be administered in any sterile, biocompatible pharmaceutical carrier including, but not limited to, saline, buffered saline, dextrose, and water.

The pharmaceutical compositions utilised in this invention may be administered by any number  
15 of routes including, but not limited to, oral, intravenous, intramuscular, intra-arterial, intramedullary, intrathecal, intraventricular, transdermal, subcutaneous, intraperitoneal, intranasal, enteral, topical, sublingual, or rectal means.

In addition to the active ingredients, these pharmaceutical compositions may contain suitable  
20 pharmaceutically-acceptable carriers comprising excipients and auxiliaries which facilitate processing of the active compounds into preparations which can be used pharmaceutically. Further details on techniques for formulation and administration may be found in the latest edition of Remington's Pharmaceutical Sciences (Maack Publishing Co., Easton, PA).

25 Pharmaceutical compositions for oral administration can be formulated using pharmaceutically acceptable carriers well known in the art in dosages suitable for oral administration. Such carriers enable the pharmaceutical compositions to be formulated as tablets, pills, dragees, capsules, liquids, gels, syrups, slurries, suspensions, and the like, for ingestion by the patient.

30 Pharmaceutical preparations for oral use can be obtained through combining active compounds with solid excipient and processing the resultant mixture of granules (optionally, after grinding) to obtain tablets or dragee cores. Suitable auxiliaries can be added, if desired. Suitable excipients include carbohydrate or protein fillers, such as sugars, including lactose, sucrose, mannitol, and sorbitol; starch from corn, wheat, rice, potato, or other plants; cellulose, such as  
35 methyl cellulose, hydroxypropylmethyl-cellulose, or sodium carboxymethylcellulose; gums, including arabic and tragacanth; and proteins, such as gelatin and collagen. If desired,

disintegrating or solubilising agents may be added, such as the cross-linked polyvinyl pyrrolidone, agar, and alginic acid or a salt thereof, such as sodium alginate.

5 Dragee cores may be used in conjunction with suitable coatings, such as concentrated sugar solutions, which may also contain gum arabic, talc, polyvinylpyrrolidone, carbopol gel, polyethylene glycol, and/or titanium dioxide, lacquer solutions, and suitable organic solvents or solvent mixtures. Dyestuffs or pigments may be added to the tablets or dragee coatings for product identification or to characterise the quantity of active compound, i.e., dosage.

10 Pharmaceutical preparations which can be used orally include push-fit capsules made of gelatin, as well as soft, sealed capsules made of gelatin and a coating, such as glycerol or sorbitol. Push-fit capsules can contain active ingredients mixed with fillers or binders, such as lactose or starches, lubricants, such as talc or magnesium stearate, and, optionally, stabilizers. In soft capsules, the active compounds may be dissolved or suspended in suitable liquids, such as fatty oils, liquid, or  
15 liquid polyethylene glycol with or without stabilisers.

Pharmaceutical formulations suitable for parenteral administration may be formulated in aqueous solutions, preferably in physiologically compatible buffers such as Hanks's solution, Ringer's solution, or physiologically buffered saline. Aqueous injection suspensions may contain  
20 substances which increase the viscosity of the suspension, such as sodium carboxymethyl cellulose, sorbitol, or dextran. Additionally, suspensions of the active compounds may be prepared as appropriate oily injection suspensions. Suitable lipophilic solvents or vehicles include fatty oils, such as sesame oil, or synthetic fatty acid esters, such as ethyl oleate, triglycerides, or liposomes. Non-lipid polycationic amino polymers may also be used for  
25 delivery. Optionally, the suspension may also contain suitable stabilisers or agents to increase the solubility of the compounds and allow for the preparation of highly concentrated solutions.

For topical or nasal administration, penetrants appropriate to the particular barrier to be permeated are used in the formulation. Such penetrants are generally known in the art.

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The pharmaceutical compositions of the present invention may be manufactured in a manner that is known in the art, e.g., by means of conventional mixing, dissolving, granulating, dragee-making, levigating, emulsifying, encapsulating, entrapping, or lyophilizing processes. The pharmaceutical composition may be provided as a salt and can be formed with many acids,  
35 including but not limited to, hydrochloric, sulphuric, acetic, lactic, tartaric, malic, and succinic acid. Salts tend to be more soluble in aqueous or other protonic solvents than are the

corresponding free base forms. In other cases, the preferred preparation may be a lyophilized powder which may contain any or all of the following: 1 mM to 50 mM histidine, 0.1 % to 2% sucrose, and 2% to 7% mannitol, at a pH range of 4.5 to 5.5, that is combined with buffer prior to use. After pharmaceutical compositions have been prepared, they can be placed in an appropriate container and labelled for treatment of an indicated condition. For administration of polypeptides of the present invention, such labelling would include amount, frequency, and method of administration.

Pharmaceutical compositions suitable for use in the invention include compositions wherein the active ingredients are contained in an effective amount to achieve the intended purpose. The determination of an effective dose is well within the capability of those skilled in the art. For any compound, the therapeutically effective dose can be estimated initially either in cell culture assays, e.g., of neoplastic cells or in animal models such as mice, rats, rabbits, dogs, or pigs. An animal model may also be used to determine the appropriate concentration range and route of administration. Such information can then be used to determine useful doses and routes for administration in humans. A therapeutically effective dose refers to that amount of active ingredient, for example polypeptide, antibody, agonist, antagonist or inhibitors, which ameliorates the symptoms or condition. Therapeutic efficacy and toxicity may be determined by standard pharmaceutical procedures in cell cultures or with experimental animals, such as by calculating the ED<sub>50</sub> (the dose therapeutically effective in 50% of the population) or LD<sub>50</sub> (the dose lethal to 50% of the population) statistics. The dose ratio of therapeutic to toxic effects is the therapeutic index, and it can be expressed as the ED<sub>50</sub>/LD<sub>50</sub> ratio. Pharmaceutical compositions which exhibit large therapeutic indices are preferred. The data obtained from cell culture assays and animal studies are used to formulate a range of dosage for human use. The dosage contained in such compositions is preferably within a range of circulating concentrations that includes the ED<sub>50</sub> with little or no toxicity. The dosage varies within this range depending upon the dosage form employed, the sensitivity of the patient, and the route of administration. The exact dosage will be determined by the practitioner, in light of factors related to the subject requiring treatment. Dosage and administration are adjusted to provide sufficient levels of the active moiety or to maintain the desired effect. Factors which may be taken into account include the severity of the disease state, the general health of the subject, the age, weight, and gender of the subject, time and frequency of administration, drug combination(s), reaction sensitivities, and response to therapy. Long-acting pharmaceutical compositions may be administered every 3 to 4 days, every week, or biweekly depending on the half-life and clearance rate of the particular formulation.

Normal dosage amounts may vary from about 0.1 ug to 100,000 ug, up to a total dose of about 1 gram, depending upon the route of administration. Guidance as to particular dosages and methods of delivery is provided in the literature and generally available to practitioners in the art.

5

Those skilled in the art will employ different formulations for nucleotides than for proteins or their inhibitors. Similarly, delivery of polynucleotides or polypeptides will be specific to particular cells, conditions, locations, etc.

- 10 Any of the therapeutic methods described above may be applied to any subject in need of such therapy, including, for example, mammals such as dogs, cats, cows, horses, rabbits, monkeys, and most preferably, humans.

- 15 In another aspect, there is provided a method of diagnosis of disease in a subject, comprising administration to the subject antibodies which specifically bind the polypeptides of the invention. Antibodies may be used for the diagnosis of disorders characterised by expression of polypeptides of the invention, or in assays to monitor patients being treated with polypeptides or agonists, antagonists, or inhibitors. Antibodies useful for diagnostic purposes may be prepared in the same manner as described above for therapeutics. Diagnostic assays include methods
- 20 which utilise the antibody and a label to detect polypeptide in human body fluids or in extracts of cells or tissues. The antibodies may be used with or without modification, and may be labelled by covalent or non-covalent attachment of a reporter molecule. A wide variety of reporter molecules, several of which are described above, are known in the art and may be used.

- 25 A variety of protocols for measuring proteins including ELISAS, RIAS, and FACS, are known in the art and provide a basis for diagnosing altered or abnormal levels of protein expression. Normal or standard values for expression are established by combining body fluids or cell extracts taken from normal mammalian subjects, preferably human, with antibody under conditions suitable for complex formation. The amount of standard complex formation may be
- 30 quantitated by various methods, preferably by photometric means. Expression levels in subject, control, and disease samples from biopsied tissues are compared with the standard values. Deviation between standard and subject values establishes the parameters for diagnosing disease.

- 35 In another embodiment, there is provided a method of diagnosis of disease in a subject, the method comprising administration of polynucleotides of the present invention. The



polynucleotides which may be used include oligonucleotide sequences, complementary RNA and DNA molecules, and PNAS. The polynucleotides may be used to detect and quantitate gene expression in biopsied tissues in which expression may be correlated with disease. The diagnostic assay may be used to determine absence, presence, and excess expression of polypeptides of the present invention, and to monitor regulation of expression levels during therapeutic intervention.

In a further embodiment, a method of diagnosis is provided which comprises administration to a subject of probes which are capable of detecting polynucleotide sequences, including genomic sequences, encoding polypeptides of the invention or closely related molecules. Such probes may be used to identify nucleic acid sequences which encode polypeptides of the invention. The specificity of the probe, whether it is made from a highly specific region, e.g., the 5' regulatory region, or from a less specific region, e.g., a conserved motif, and the stringency of the hybridization or amplification (maximal, high, intermediate, or low), will determine whether the probe identifies only naturally occurring sequences encoding polypeptides of the invention, alleles, or related sequences.

Probes may also be used for the detection of related sequences, and should preferably have at least 50% sequence identity to any of the polynucleotide sequences of the present invention. The hybridization probes of the subject invention may be DNA or RNA and may be derived from the sequence of Figure 2, or 4.

Means for producing specific hybridization probes for DNAs include the cloning of polynucleotide sequences of the present invention or derivatives thereof into vectors for the production of mRNA probes. Such vectors are known in the art, are commercially available, and may be used to synthesise RNA probes in vitro by means of the addition of the appropriate RNA polymerases and the appropriate labelled nucleotides. Hybridization probes may be labelled by a variety of reporter groups, for example, by radionucleotides such as  $P^{32}$ ,  $S^{31}$  or by enzymatic labels, such as alkaline phosphatase coupled to the probe via avidin/biotin coupling systems, and the like.

In further embodiments, oligonucleotides or longer fragments derived from any of the polynucleotide sequences described herein may be used as targets in a microarray. The microarray can be used to monitor the expression level of large numbers of genes simultaneously and to identify genetic variants, mutations, and polymorphisms. This information may be used to determine gene function, to understand the genetic basis of a disorder, to diagnose a disorder, and to develop and monitor the activities of therapeutic agents. Microarrays may be prepared,

used, and analysed using methods known in the art. (See, 20 e.g., Brennan, T.M. et al. (1995) U.S. Patent No. 5,474,796; Schena, M. et al. (1996) Proc. Natl. Acad. Sci. 93:10614-10619; Baldeschweiler et al. (1995) PCT application W095/251116; Shalon, D. et al. (1995) PCT application W095135505; Heller, R.A. et al. (1997) Proc. Natl. Acad. Sci. 94:2150-2155; and  
5 Heller, M.J. et al. (1997) U.S. Patent No. 5,605,662).

The polynucleotide sequences of the present invention may be used in Southern or northern analysis, dot blot, or other membrane-based technologies; in PCR technologies; in dipstick, pin, and ELISA assays; and in microarrays utilising fluids or tissues from patients to detect altered  
10 gene expression. Such qualitative or quantitative methods are well known in the art.

In a particular embodiment, the nucleotide sequences of the present invention may be useful in assays that detect the presence of associated disorders, particularly those mentioned above. The nucleotide sequences may be labelled by standard methods and added to a fluid or tissue sample  
15 from a patient under conditions suitable for the formation of hybridization complexes. After a suitable incubation period, the sample is washed and the signal is quantitated and compared with a standard value. If the amount of signal in the patient sample is significantly altered in comparison to a control sample then the presence of altered levels of nucleotide sequences in the sample indicates the presence of the associated disorder. Such assays may also be used to  
20 evaluate the efficacy of a particular therapeutic treatment regimen in animal studies, in clinical trials, or to monitor the treatment of an individual patient.

Also envisaged are methods of diagnosis comprising administration to a subject of agents including agonists and antagonists of the polypeptides of the invention, the polypeptides of the  
25 invention or fragments thereof, and complements of the polynucleotides of the invention.

The above molecules of the present invention may be used for the diagnosis of eosinophil mediated inflammatory disease. Examples of such disorders include, but are not limited to asthma, emphysema, COPD, bronchitis, allergic disorders such as atopic dermatitis and  
30 NERDS (nodules, eosinophilia, rheumatism, dermatitis and swelling); vasculitic granulomatous diseases including polyarteritis, Wegeners granulomatosis; some auto-immune diseases; interstitial and other pulmonary diseases including eosinophilic pneumonia, sarcoiditis and idiopathic pulmonary fibrosis; and neoplastic and myoproliferative diseases including hypereosinophilic syndrome, T cell lymphoma and hodgkins disease.

In order to provide a basis for the diagnosis of an eosinophil mediated inflammatory disorder, a normal or standard profile for expression is established. This may be accomplished by combining body fluids or cell extracts taken from normal subjects, either animal or human, with at least one sequence, or a fragment thereof, under conditions suitable for hybridization or amplification. Standard hybridization may be quantified by comparing the values obtained from normal subjects with values from an experiment in which a known amount of a substantially purified polynucleotide is used. Standard values obtained in this manner may be compared with values obtained from samples from patients who are symptomatic for a disorder. Deviation from standard values is used to establish the presence of a disorder. Once the presence of a disorder is established and a treatment protocol is initiated, hybridization assays may be repeated on a regular basis to determine if the level of expression in the patient begins to approximate that which is observed in the normal subject. The results obtained from successive assays may be used to show the efficacy of treatment over a period ranging from several days to months.

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A more definitive diagnosis of this type may allow health professionals to employ preventative measures or aggressive treatment earlier thereby preventing the development or further progression of the disease.

Additional diagnostic uses for polynucleotides of the present invention may involve the use of PCR. Oligomers may be chemically synthesised, generated, enzymatically, or produced in vitro. Oligomers will preferably contain a fragment of a polynucleotide of the present invention, or a fragment of a polynucleotide complementary thereto, and will be employed under optimised conditions for identification of a specific gene or condition. Oligomers may also be employed under less stringent conditions for detection or quantitation of closely related DNA or RNA sequences. Methods which may also be used to quantitate expression include radiolabelling or biotinylating nucleotides, coamplification of a control nucleic acid, and interpolating results from standard curves. (See, e.g., Melby, P.C. et al. (1993) J. Immunol. Methods 159:235-244; and Duplaa, C. et al. (1993) Anal. Biochem. 229-236). The speed of quantitation of multiple samples may be accelerated by running the assay in an ELISA format where the oligomer of interest is presented in various dilutions and a spectrophotometric or calorimetric response gives rapid quantitation.

In another aspect of the present invention, polynucleotide sequences of the invention may be used to generate hybridisation probes useful in mapping the naturally occurring genomic sequence. The sequences may be mapped to a particular chromosome, to a specific region of a

chromosome, or to artificial chromosome constructions, e.g., human artificial chromosomes (HACs), yeast artificial chromosomes (YACs), bacterial artificial chromosomes (BACs), bacterial PI constructions, or single chromosome cDNA libraries. (See, e.g., Price, C.M. (1993) 30 Blood Rev. 7:127-134; and Trask, B.J. (1991) Trends Genet. 7:149-154).

5

Fluorescent in situ hybridization (FISH) may be correlated with other physical chromosome mapping techniques and genetic map data. (See, e.g., Heinz-Ulrich, *et al.*(1995)in Meyers, R.A. (ed.) Molecular Biology and Biotechnology, VCH Publishers New York, NY, pp.965-968). Examples of genetic map data can be found in Various scientific journals or at the Online Mendelian Inheritance in Man (OMB4) site. Correlation between the location of the gene on a physical chromosomal map and a specific disorder, or a predisposition to a specific disorder, may help define the region of DNA associated with that disorder. The nucleotide sequences of the invention may be used to detect differences in gene sequences among normal, carrier, and affected individuals.

15

In situ hybridization of chromosomal preparations and physical mapping techniques, such as linkage analysis using established chromosomal markers, may be used for extending genetic maps. Often the placement of a gene on the chromosome of another mammalian species, such as mouse, may reveal associated markers even if the number or arm of a particular human chromosome is not known. New sequences can be assigned to chromosomal arms by physical mapping. This provides valuable information to investigators searching for disease genes using positional cloning or other gene discovery techniques. Once the disease or syndrome has been crudely localised by genetic linkage to a particular genomic region, any sequences mapping to that area may represent associated or regulatory genes for further investigation. (See, e.g., Gatti, R.A. et al. (1988) Nature 336:577-580). The nucleotide sequence of the subject invention may also be used to detect differences in the chromosomal location due to translocation, inversion, etc., among normal, carrier, or affected individuals.

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In yet another aspect of the invention, there is provided a transgenic non-human animal comprising a polynucleotide sequence according to the second or third aspects of the invention. The transgenic non-human animal may comprise a polypeptide according to the first aspect of the invention.

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In further aspects, the polynucleotide or polypeptide sequences of the present invention may be used in any molecular biology techniques that have yet to be developed, provided the new

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techniques rely on properties of nucleotide sequences that are currently known, including, but not limited to, such properties as the triplet genetic code and specific base pair interactions.

The present invention may be better understood by reference to the following non-limiting

- 5 Examples, which are provided as exemplary of the invention. The present invention is not to be limited in scope by the specific embodiments described herein. Indeed, various modifications of the invention in addition to those described herein will become apparent to those skilled in the art from the foregoing description and the accompanying figures. Such modifications are intended to fall within the scope of the invention.

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It is further to be understood that all base sizes or amino acid sizes, and all molecular weight or molecular mass values, given for nucleic acids or polypeptides are approximate, and are provided for description.

## EXAMPLES

### *Example 1: Cloning of Human Eosinophil cDNA*

5        This example describes the cloning of polynucleic acids expressed by human peripheral blood eosinophils.

#### *Example 1.1: Purification of Human Peripheral Blood Eosinophils*

Eosinophils were purified from 200ml whole blood essentially as described by Dubois et al.,  
10    *Am. J. Respir. Cell Mol. Biol.*, 1998. Essentially, the blood was layered on to Accuspin tubes with filter histopaques (Sigma) and centrifuged (2100rpm) for 20 minutes. The Peripheral Blood Mononuclear Cell (PBMC) layer was carefully removed and the filters washed twice with PBS. The filters were punctured and the blood (approx.15ml) under each filter was transferred to sterile 50ml tubes. The lysis of the red blood cells was performed as follows:  
15    6% dextran (6ml) and PBS (44ml) were added to each tube, the lysis solution was mixed by inverting and left to incubate for 45 min. at room temperature (RT). The supernatants were subsequently collected, pooled and centrifuged (1,600rpm) for 5 min. The resultant pellet was resuspended in PBS (5ml) and hypotonic shock was performed to completely remove the red blood cell contamination from the granulocyte layer. The granulocytes were incubated with  
20    anti-CD16 beads (Dyna, Norway) for 40 min. at 4°C and the eosinophils subsequently purified from the neutrophils by negative selection.

#### *Example 1.2: Extraction of Total Cellular RNA*

Total cellular RNA was extracted from the eosinophils using essentially the modified  
25    RNazolB method described by Kodavanti et al. *Exp. Lung Res.*, 1996. Total cellular RNA quality was assessed by electrophoresis through formamide/formaldehyde TAE gels, as described in (Maniatis T. et al., "Molecular Cloning, a Laboratory Manual," Cold Spring Harbor Laboratory, Cold Spring Harbor, N.Y., 1982; Ausubel F.M. et al. (eds.), "Current Protocols in Molecular Biology," John Wiley & Sons, New York, 1987). Both 28 S and 18S  
30    ribosomal RNAs were detected as shown in figure 1.

#### *Example 1.3: Extraction of polyA+ mRNA*

Poly(A) mRNA was purified from total RNA using a Micro poly A+ kit (Ambion), according to the manufacturers protocol.

***Example 1.4: Production of PCR amplified cDNA***

cDNA was synthesised from 400ng human eosinophil mRNA SMART PCR cDNA Synthesis Kit (Clontech). The methodology used was essentially as described by the manufacturer, with the following modifications: the two 5' and 3' SMART oligonucleotide primers, respectively, were replaced by modified HPLC purified primers having the sequence shown in figure 4. These primers contain essentially the same amplification and Poly dT sequences described by the manufacturers Clontech. The RsaI restriction sites are replaced by AscI and NotI restriction sites. These new restriction sites, allow directional cloning, but also have 8-base pair enzyme recognition sequences. 8-base pair recognition sequences are rare in mammalian genes, consequently cDNA sequences are unlikely to be digested internally with the use of these enzymes. The size range of the amplified cDNA was between 200bp and 7kb as shown in figure 2.

***Example 1.5: Modification of cDNA library cloning vector***

The vectors pSKII (Stratagene) was modified by the inclusion of additional 8bp sites (AscI and PacI). The vector was digested PstI/EcoRI and ligated with dephosphorylated double stranded oligonucleotides to generate the additional 8bp sites shown in figure 5. The genetic engineering techniques used to clone and insert cDNAs into these plasmids employed routine protocols described in Maniatis, 1989.

***Example 1.6: cDNA Library Construction***

PCR amplified cDNA (approx. 15µg) was digested with NotI and AscI, and size fractionated on a Sephacryl S-500 gel filtration column (Gibco BRL Life Technologies), as described by the manufacturer. Fractions containing cDNA >500bp were combined and ligated. All ligations were performed in 20µl reaction volume using 50ng modified pBluescript SK II (+) vector, 80ng cDNA and 1 unit of T4 DNA Ligase (Gibco BRL Life Technologies), and incubated at 16°C O/N. Ligation reactions were purified (phenol/chloroform extraction and ethanol precipitated, as described in Maniatis, 1989) and used to transform *E. Coli* TG1 cells (supE, hsdD5, thi, D(lac-proAB), F'(tra D36 pro A<sup>+</sup> B<sup>+</sup> lacI<sup>q</sup> lacZDM15), Stratagene) by electrophoration as follows: TG1 cells were thawed on ice and mixed with 1µl ligated DNA. The cell/DNA mixture was transferred to a chilled electroporation cuvette (0.1 cm; BIORAD) and pulsed for 4 seconds at (1700V, 200A, 25µF; Gene Pulser II; BIO RAD). SOC (960µl) was added to resuspend the cells, and the suspension incubated at 37°C for 1h. Transformed cells are plated onto LB Agar (L-broth: NaCl (5 g/l), Bacto-tryptone (10 g/l), Yeast extract (5 g/l);

Difco), containing ampicillin, under blue/white selection. The library contained  $> 1 \times 10^6$  independent clones, with an average insert size range of 400bp to 2.5kb as determined by restriction digest.

5      **Example 1.7: Normalisation of cDNA Library**

Plasmid DNA from the eosinophil cDNA library (50µg) was digested with AscI/NotI restriction enzymes and the insert fragments isolated by gel purification (called 'Tracer'). Purified PCR products which had been amplified (using T7/T3 primer sequences) from 5000 eosinophil miniprep cDNA clones were pooled and photobiotinylated ('Driver'). The methodology for photobiotinylation and subtraction, was essentially as described by Wang, Z and Brown, DD; *Proc Natl Acad Sci U S A* 1991 Dec 15;88(24):11505-9. Two rounds of hybridisation/subtraction (68°C, 20h ) with 100:1 biotinylated Driver:Tracer ratio are carried out. Hybrids were removed with Streptavidin and extracted 5 times with phenol/chloroform. The enriched Tracer DNA was ethanol precipitated, ligated into modified pSK II and transformed in *E Coli* TG1 cells by electroporation (as described in Example 1.6).

20      **Example 1.8: Purification of Plasmid DNA**

Plasmid DNA clones was purified on a Qiagen 9600 Robot, using Qiaprep 96 Turbo kits (Qiagen), as described by the manufacturer.

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**Example 2: High Throughput Sequencing**

This example describes determination of the complete/partial DNA sequence of each isolated cDNA clone. The cDNA was sequenced, using an Applied Biosystems 377 or 373 DNA Sequencing System, using the Prism Big Dye Terminator Cycle Sequencing chemistry (PE-BioSystems). The modified pBluescriptIIISK/cDNA insert clones are sequenced on the 5' and the 3' vector strand using the T3 promoter primer (5'AATTAACCCCTCACTAAAGGG3') and the T7 promoter primer, respectively (5'TAATACGACTCACTATAGGG3'). Where necessary the cDNA was sequenced internally using primers based on previous sequencing results, essentially following the same protocols.

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**Example 3: Database Search and Sequence Annotation**

This example describes searching the publicly available databases GenBank, SwissProt, TrEMBL (Bairoch A., Apweiler R., "The SWISS-PROT protein sequence data bank and its supplement TrEMBL", *Nucleic Acids Res* 1999 Jan 1;27(1):49-54 ) and PFAM (Bateman A, et al. "Pfam 3.1: 1313 multiple alignments and profile HMMs match the majority of proteins", *Nucleic Acids Res.* 1999 Jan 1;27(1):260-2.). GenBank is the NIH genetic sequence database,

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an annotated collection of all publicly available DNA sequences ( Nucleic Acids Research 1999 Jan 1;27(1):12-7) and has been searched for certain of the nucleotide sequences of the invention, which correspond to the determined DNA sequences for each isolated cDNA clone, to ensure the novelty of these sequences. Additional sequencing has been performed for sequence elongation, sequence assembly and sequence verification. Functional annotation *in silico* may be performed to search the deduced protein sequences for protein domains and similarities to known protein sequences.

The base-calling program Phred (Ewing B. et al., "Base-calling of automated sequencer traces using phred. II. Error probabilities", *Genome Res* 1998 Mar;8(3):186-94) was used to analyse the DNA sequence traces, to deduce nucleotide sequences and to assign quality scores for each individual nucleotide of these sequences. The derived sequences covering the 5' end of each clone insert were compared versus the GenBank databases version 111 for primate sequences and version 110 for pubESTs, respectively using the BLAST database search program version 2.0.8 (Altschul, S. et al., "Gapped BLAST and PSI-BLAST: a new generation of protein database search programs", *Nucleic Acids Res* 1997 Sep 1;25(17):3389-402). In order to identify and mask repetitive regions all query sequences were firstly compared against a database containing a collection of human repetitive sequences called REPBASE (Prepared for National Center for Biotechnology Information Contract No. N01-LM-2-3526 P.I. Jerzy Jurka, Linus Pauling Institute of Science and Medicine 440 Page Mill Rd Palo Alto, CA 94306). The XBLAST software (Claverie J. M. and States D. J. "Information Enhancement Methods for Large Scale Sequence Analysis", *Computers and Chemistry* 1993, 17: 191-201.) was used to mask all regions with homology to any of those repeat sequences. Functionally, XBLAST reads a BLAST output file and generates query sequences where all segments with hits are masked. BLAST version 2.0.8 was used for subsequent database searches of these masked query sequences against all database entries of the GenBank databases version 111 for primate sequences and version 110 for pubESTs and to evaluates the statistical significance of detected sequence similarities.

None of the polynucleotide sequences filed here showed significant homology in GenBank databases version 111 for non-genomic primate (pri) sequences and version 110 for public EST sequences (pubEST). All these sequences were found to be above the user-selected threshold of significance (BLAST e-value) of  $10^{-7}$  and are therefor assumed to represent novel human cDNA sequences.

144 cDNA clones were elongated by generating the 3' sequence for each clone. The corresponding 5' and 3' read of each clone insert was assembled utilising the Phrap software ("phragment assembly program", or "phil's revised assembly program"; ©1994-1999 by Phil Green, University of Washington) and the resulting sequence assemblies ("contigs") were manually edited in the Consed sequence editor (Gordon D. et al., "Consed: a graphical tool for sequence finishing", *Genome Res* 1998 Mar;8(3):195-202) to increase the accuracy of the deduced consensus sequences. These derived consensus sequences correspond to the full-length insert of each cDNA clone. The resulting sequences correspond to Seq Id Nos: 1-466 (polynucleotide) all of which are at least 200 nucleotides in length, and include no more than 8% of uncalled bases (where N is recorded rather than A, C, G, or T).

For functional annotation *in silico* the deduced protein sequence may be examined using different approaches to detect remote homologies to characterised protein sequences and similarities to known protein domains. These methods include sequence comparisons against different databases including GenBank and PFAM (Bateman A, et al. "Pfam 3.1: 1313 multiple alignments and profile HMMs match the majority of proteins", *Nucleic Acids Res.* 1999 Jan 1;27(1):260-2.) and sensitive search algorithms using iterated sequence database search methods (Taylor WR, et al. "Iterated sequence databank search methods." *Comput Chem.* 1999 Jun 15;23(3-4):365-85.) and profile hidden Markov models for the detection of distant sequence homologs and low conserved protein domains (Eddy SR, et al., "Maximum discrimination hidden Markov models of sequence consensus", *J Comput Biol.* 1995 Spring;2(1):9-23.).

For the sequence listing the most 5-prime region of each sequence has been translated in all three possible reading frames and specified whenever the deduced product resulted in a hypothetical peptide of more than 9 amino acids. Additional 5-prime sequence information can be unravelled in order to define the correct and full length coding sequence.

#### Example 4: Construction and Use of Microarray, for Amersham Microarray System

This example describes the use of a microarray system developed and commercialised (Amersham Pharmacia Biotechnology). This methodology, essentially using protocols pioneered by Pat Brown and colleagues (Schena, M et al. Quantitative monitoring of gene expression patterns with a complementary DNA microarray. *Science* 270, 467-470 (1995).

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##### Example 4.1: PCR Amplification of cDNA

cDNA fragments of up to 2.5kb in length were amplified by PCR from the eosinophil cDNA clones. PCR reactions (100 µl) were performed in 1x Taq DNA Polymerase buffer using 2.5 U Taq DNA polymerase (Qiagen), 100 mM dNTPs and 400 nM each of T7 and T3 primers [T7 primer: 5'GTAATACGACTCACTATAGGGC3', T3 primer: 5'AATTAACCCTCACTAAAGGG3']. PCR was performed in 96 well microtitre plates with a 1 min denaturation step at 94°C, 36 rounds of amplification (denaturation 94°C, 40 sec, annealing 55°C, 30 sec, extension 72°C, 2 min), followed by a 2min extension step at 72°C.

*Example 4.2: Purification, QC and Quantitation of PCR Products*

Quadruplicate 100µl PCR reactions were pooled and purified on a Biorobot-9600 (Qiagen) using the Qiaquick 96 PCR Biorobot kit (Qiagen). 100µl of PCR reactions were mixed with 500µl of buffer PB and applied sequentially to Qiaquick modules until the 4 replicate reactions had been applied to a single well. Qiaquick modules were washed with 2 x 750µl of PE per well, dried using the vacuum manifold and DNA was eluted with 80µl of water into 96 well microtitre plates.

DNA was quantitated using the fluorescent reagent Sybrgreen (Molecular Probes). 300µl of a 1:3000 of the Sybrgreen dye was mixed with 1µl of purified DNA in a 96 well white Opti plate (Packard). Fluorescence was measured, using a Victor plate reader (Wallac), at an excitation wavelength of 495nm and an emission wavelength of 520nm. A standard curve was constructed using a plasmid DNA dilution series; the concentrations of which were determined by Absorbance at 260nm.

All purified DNA samples were analysed by agarose gel electrophoresis to verify that PCR fragments of a size consistent with the sequencing analysis for that clone (see example 2) had been generated. Samples were dried in a centrifugal evaporator (Savant) and reconstituted to 500 ng/µl in 50% (v/v) DMSO. 20µl of sample /well was transferred from 4 (96 well) microtitre plates to a 384 well microtitre plate for spotting onto microarray slides.

*Example 4.3: Spotting of Microarray*

DNA was spotted onto Type 7 mirrored slides (Amersham) using the GenIII microarray spotter (Amersham), using conditions essentially as described by the manufacturer. Humidity was controlled within the spotter at 55%. Normal mode spotting was employed which produced replicate arrays on the right and left side of each slide. UV crosslinking of the DNA onto the slides was achieved using a CL-100 Ultraviolet Crosslinker (UVP) set at 100mJ/cm<sup>2</sup>. Slides were stored dessicated in the dark until use.

**Example 4.4: Preparation of Fluorescently labelled Samples**

**Example 4.4.1: RNA preparation**

RNA was prepared from either primary cells (e.g. eosinophils) or from cell lines (e.g. A549 human lung epithelial cells). Total RNA was isolated from cell lines using the RNeasy kit (Qiagen), using procedures as described by the manufacturer. RNA was isolated from primary cells using the modified RNazolB method described by Kodavanti et al. Exp. Lung Res., 1996. Total RNA integrity was assessed by denaturing agarose gel electrophoresis, as described in Example 1.2. RNA was quantified by Abs 260nm determination.

Poly(A+) mRNA was purified from total cellular RNA using a Micro poly A+ kit (Ambion), according to the manufacturer's protocol.

**Example 4.4.2: Labelled cRNA Samples**

1 µg of mRNA and 100 pmoles of T7-(dT)<sub>24</sub> were denatured at 70°C for 10min in a volume of 13µl. DTT, dNTPs and 5X 1<sup>st</sup> strand buffer were added to 10mM, 0.5mM and 1X respectively, and incubated in a total volume of 20µl for 2 min at 37°C. Reverse transcription was initiated by addition of 1µl of 200 U/µl superscript II enzyme (Gibco BRL Life Technologies) and incubating at 37°C for 1 h. Second strand cDNA synthesis was initiated by addition of 1µl of 10U/µl DNA Ligase (Gibco BRL Life Technologies), 4µl of 10U/µl DNA Polymerase I (Gibco BRL Life Technologies), 1µl of 2U/µl RNase H (Gibco BRL Life Technologies) and incubated in a total volume of 150µl for 2 hours at 16°C. After this incubation 2µl of 5U/µl T4 DNA Polymerase was added and incubated for 5 minutes at 16°C. 10µl of 0.5M EDTA was added to the double stranded cDNA. The cDNA was, phenol/chloroform extracted, ethanol precipitated, washed with 70% ethanol and air dried. 0.5-1µg of linearised T7 cDNA template was reconstituted in a volume of 2µl of DEPC water (Ambion). T7 10X reaction buffer (Ambion), rA/C/GTP, rUTP and rcyUTP (either Cy3 labelled CTP or Cy5 labelled CTP, Amersham) were added to 1X, 150nmoles, 100nmoles and 30nmoles respectively. *In-vitro* transcription was initiated by adding 2µl of T7 RNA Polymerase (Ambion) and incubated in a total volume of 20µl for 6 hours at 37°C. After this incubation the DNA template was removed by addition of 1µl of RNase-free DNase (Ambion) and incubated for 15 min at 37°C. The labelled cRNA sample was then purified using a RNeasy purification kit (Qiagen), essentially as described by the manufacturers but with two washes with PE buffer and elution with 2x 40µl of DEPC water. The resultant purified sample was, quantitated by Abs260nm, aliquoted into amounts corresponding to 2µg of cRNA

per tube and dried in a centrifugal evaporator (Savant model SC110). Sample was stored at -20°C in the dark until ready to use in the hybridisation.

*Example 4.4.3: Labelled cDNA Samples from Total RNA*

5        25 µg of total RNA and 1µg of Oligo dT (Amersham) were denatured at 70°C for 10 minutes in a volume of 11µl. DTT, dNTPs, dcyCTP (either Cy3 labelled CTP or Cy5 labelled CTP, Amersham) and 5X 1<sup>st</sup> strand buffer were added to 10mM, 0.1mM, 62nM and 1X respectively, and incubated in a total volume of 19µl for 10 min at 22°C. Reverse transcription was initiated by addition of 2ul of 200U/µl superscript II enzyme ( Gibco BRL Life  
10        Technologies) and incubating at 42°C for 2.5 h. After this incubation the cDNA sample was ethanol precipitated, washed with 70% ethanol, air dried and resuspended in 40µl of water. The cDNA:mRNA hybrid was denatured by addition of NaOH to 250mM and incubating at 37°C for 10 min. The hydrolysis was terminated by neutralisation with 6µl of 1M Hepes pH 8. The labelled cDNA sample was then purified using a PCR purification kit (Qiagen),  
15        essentially as described by the manufacturers but with two washes with PE buffer and elution with 2x 30µl of 10mM Tris pH 8.5. The resultant purified sample was aliquoted into amounts corresponding to preparations from 10µg of total RNA per tube and dried in a centrifugal evaporator (Savant). Sample was stored at -20°C in the dark until ready to use in the hybridisation  
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*Example 4.4.4: Labelled cDNA Samples from mRNA*

cDNA samples prepared from mRNA were made using essentially the same procedure detailed in section 4.4.3 but using 2.5 µg of mRNA instead of 25 µg of total RNA. Sample was aliquoted at the final stage into amounts corresponding to preparations from 1 µg of starting  
25        mRNA per tube.

*Example 4.5: Hybridisation of Microarray*

*Example 4.5.1: Pre-treatment of microarray slides*

30        Microarrayed slides (Example 4.3) are pre-treated by incubating in 5xSSC/0.2% SDS for 2 h at 60°C. Slides are washed 5x in distilled water, 2x in isopropanol and dried rapidly using a compressed air can.

*Example 4.5.2: Hybridisation*

Hybridisation mixtures for a single slide were prepared as follows. An aliquot of labelled sample (prepared as described in Examples 4.4.2, 4.4.3 or 4.4.4) was reconstituted in 6.7 µl of water, denaturing at 95°C for 2 min and then incubated on ice for 2 min. The sample was then added to a hybridisation mix that had been pre-equilibrated at 42°C to give final concentration of 3µg/ml Oligo A80, 50% formamide in 1x Type II hybridisation buffer (Amersham). The total volume of the hybridisation mixture was 40µl per slide and this was applied to the pre-treated microarray slides and incubated under a coverslip (22mm x 65mm), in a humid chamber at 42°C overnight.

*Example 4.5.3: Post Hybridisation washes*

Post hybridisation washes were performed at 55°C as follows.

Wash 1 - 5 min wash in 1xSSC/0.2% SDS for 5 min

Wash 2- 10 min wash in 0.1xSSC/0.2% SDS

Wash 3- 10 min wash in 0.1xSSC/0.2% SDS

Wash 4- 10 min wash in 0.01xSSC/0.1%SDS

Slides are rinsed with distilled water, dried rapidly with compressed air.

*Example 4.6: Scanning of Microarray*

The fluorescence of each spot was determined by scanning the slides in a GenIII microarray scanner (Amersham). Cy3 fluorescence was determined using an excitation wavelength of 532nm and an emission wavelength of 575nm. Cy5 fluorescence was determined using an excitation wavelength of 633nm and emission wavelength of 675nm. PMT values are set over a range 675-750 V.

*Example 4.7: Data Capture and Processing*

Images of scanned slides are analysed using ArrayVision software (Imaging Research). Expression values for each gene are determined from the fluorescence contained in a circle around each spot and a correction applied for the background fluorescence on the slide.

*Example 5: Construction and Use of Affymetrix Custom Probe Array*

This example describes the design of a customised Affymetrix probe array, using DNA sequences of isolated cDNA clones. This example also describes the methodology for use of the custom probe array. This technology is referenced through the following patents/submissions: PCT/US98/22966, PCT/US98/01206, 5,800,992 patent and PCT/US94/07106.

*Example 5.1: Details of Construction*

All sequences were screened for low complexity regions and repetitive sequences and vector contamination's using Swat and cross-match (Copyright (C) 1994-1999 by Phil Green, University of Washington) which are based on an efficient implementation of the Smith-Waterman-Gotoh algorithm (Waterman MS, "Efficient sequence alignment algorithms", *J Theor Biol.* 1984 Jun 7;108(3):333-7).

Repetitive regions of all sequences were masked prior to sequence submission to Affymetrix by comparing all sequences against REPBASE a database containing a collection of human repetitive sequences (prepared for National Center for Biotechnology Information Contract No. N01-LM-2-3526 P.I. Jerzy Jurka, Linus Pauling Institute of Science and Medicine 440 Page Mill Rd Palo Alto, CA 94306) using BLAST version 2.0.8 (Altschul, S. et al., "Gapped BLAST and PSI-BLAST: a new generation of protein database search programs", *Nucleic Acids Res* 1997 Sep 1;25(17):3389-402) in combination with the XBLAST software (Claverie J. M. and States D. J. "Information Enhancement Methods for Large Scale Sequence Analysis", *Computers and Chemistry* 1993, 17: 191-201.). XBLAST reads each BLAST output file and generates a sequence where all segments with hits against the repeat database have been masked. This masked sequences provides better templates for the probe design because non-specific regions shared by several genes have been excluded from the submitted sequences and less unwanted cross-hybridisation's will affect the experimental results obtained with the final micro-arrays.

**Example 5.2: Labelled Sample synthesis, Hybridisation and Scanning**

The methodology describing the sample synthesis, hybridisation and scanning etc. for the probe array is described in detailed protocols supplied by Affymetrix. Essentially, poly(A+) mRNA is extracted and purified from total cellular RNA (5 to 100µg) using a Micro poly(A+) kit (Ambion). The synthesis of cDNA (from 0.5-5µg mRNA) is using the Superscript Choice system kit (Gibco BRL Life Technologies), and incorporated a T7-(dT)24 primer (GENSET). Purified cDNA (upto 2µg) is in-vitro transcribed using the MEGAscript T7 Kit (Ambion), and incorporates Biotin-11-CTP and Biotin-16-UTP (final conc. 1.875mM; Sigma/Enzo). Following purification, IVT cRNA is fragmented in a magnesium containing buffer at 94°C. A hybridisation mix, containing cRNA, herring sperm DNA, acetylated BSA and a MES-based buffer, is denatured and then incubated onto the probe array at 45°C, rotating at 60rpm, for approx. 16h. Following incubation, the hybridisation mix is removed and the probe arrays washed using the Affymetrix Fluidics Station. Whilst remaining on the Fluidics Station, the probe array is stained with Streptavidin Phycoerythrin (SAPE; final conc. 10µg/ml; Molecular Probes). For probe arrays having a 24µm x 24µm feature size, an additional

antibody amplification, washing and staining step is used, as follows: Following the first addition of SAPE (10 min. 25°C), the probe array is washed and then incubated with a solution containing biotinylated anti-streptavidin antibody (Vector Laboratories; 10 min. 25°C). After a further cycle of washing the probe array is stained a second time with SAPE (10 min. 25°C). The probe array is scanned, after the wash protocols are complete, using the Affymetrix scanner (570nm).

***Example 5.3: Data Capture and Processing***

After scanning the probe array, the resulting image data created is stored as a .dat file. In the first step of the analysis, a grid is automatically placed over the .dat file so that it demarcates each probe cell. A probe array library file (.cif, supplied by Affymetrix), defines the identity and location of each gene probe. The scanned image is then analysed using the Affymetrix GeneChip software, which generates an exportable .txt file containing expression information and characteristics for each DNA sequence represented upon the probe array as shown in Figure X.



**Example 6: Details of Experiments for Microarray Profiling**

There are many ways microarrays can be used to produce functional annotation of the genes included on the array. The following examples describe different experiments conducted to profile mRNA expression levels using microarrays (Affymetrix and Amersham type). Such experiments form part of the strategy to identify candidate target genes (such techniques are review in the Supplement to *Nature Genetics*, 21: 1999).

**Example 6.1: Tissue Distribution**

The example describes the characterisation of the expression specificity of genes, characterised by the isolated cDNA clones. Such a pattern provides indirect information about function. A gene expressed exclusively in eosinophils is likely to be involved in pathologies associated with the eosinophil such as inflammatory disease such as asthma. Effective drugs have been developed against protein targets widely expressed in the body. However, highly selective tissue expression of a drug target is attractive, as the potential for unwanted side effects may be more restricted. Knowledge of highly selective gene expression, alongside other information on a gene, can thus provide a shortcut for implicating a target in a given pathway or disease.

**Example 6.1.1: Commercial Human Tissue poly(A+) mRNA**

Labelled samples are synthesised from human tissue poly(A+) mRNA obtained from commercial sources (Clontech, InVitrogen). Tissues include, bone marrow, liver, kidney, brain and lung.

**Example 6.1.2: Purified Human Leukocytes**

Labelled samples are synthesised from poly(A+) mRNA extracted and purified from human leukocytes. Human leukocyte preparations are purified from peripheral blood essentially as described for eosinophils, and include: eosinophils, neutrophils, mononuclear cells, T cells and B cells. In some cases the purified leukocytes are stimulated/activated overnight prior to isolation of mRNA e.g. T cells treated with anti-CD3 and anti-CD28 antibodies, or B cells treated with IL-4 and anti-CD40 antibody.

**Example 6.2: Cell Based Models of Eosinophil Function**

The examples describe the characterisation of the expression pattern of genes, included on the microarray, in primary cells isolated from normal and diseases humans as well-as model cellular systems. Discrete aspects of cellular function can be biochemically and physiologically

modelled in cell lines (e.g. chemotaxis or adhesion in response to physiological cytokines). Detailed profiling of gene expression in model cell lines yields dissection of the critical pathways and cellular responses, and highlights key targets. The example describes the characterisation of the expression pattern of genes, identified from the isolated cDNA clones, in cell based model systems. Such systems provide ideal models for the functional validation of candidate targets prior to further characterisation and validation in animal models etc.

**Example 6.2.1: IL-5 Treatment of Primary Human Eosinophils**

IL-5, like its related cytokines GM-CSF and IL-3, is a key mediator in many aspects of eosinophil functional biology (Devos R et al. *J Leukoc Biol.* 1995 Jun;57(6):813-9, Okudaira H et al. *Int Arch Allergy Immunol.* 1998 Sep;117(1):11-9). Genes which are regulated in eosinophils following treatment with IL-5 might be expected to have a role in eosinophil function.

Human peripheral blood eosinophils were isolated, as described (Example 1.1), and treated with medium containing IL-5 (1 to 100pM; R&D Systems) or media alone as a control. Following treatment (1h to 18h time points), RNA was extracted as described (Example 1.2).

**Example 6.2.2: IL-5 and GM-CSF Treatment of a Human Eosinophil-Like Cell Line:**

**AML14.3D10**

The AML14.3D10 cell line has been identified and characterised as a surrogate model cell line resembling the human eosinophil (Baumann MA et al. *Stem Cells.* 1998;16(1):16-24, Paul CC et al. *Blood.* 1993 Mar 1;81(5):1193-9). Genes which are regulated in AML14.3D10 following treatment with IL-5 and/or GM-CSF might be expected to have a role in eosinophil function.

AML14.3D10 cells are cultured, as described in Example 8, and treated with medium containing IL-5 or GM-CSF (1 to 100pM; R&D Systems) or media alone as a control. Following treatment (1h to 18h time points), RNA is extracted as described (Example 1.2).

**Example 6.2.3: Adhesion of AML14.3D10 to Fibronectin**

The critical process of adhesion by an eosinophil has been modelled in AML14.3D10. The model system is described in detail in Example 8. Following adhesion (approx. 1h), the adherent and non-adherent AML14.3D10 cell populations were harvested and RNA were extracted as described (Example 1.2). In some experiments, non-adherent cells are harvested at time points upto 48h post-adhesion.

**Example 6.2.4: IL-5 Withdrawal from IL-5-dependent Cell Line: TF1.8**

Withdrawal of IL-5 from the IL-5-dependent Cell Line: TF1.8 is described in Example 8 relating to Validation. Following IL-5 withdrawal (time points between 15 min. and 48h), cells are harvested and RNA is extracted as described (Example 1.2).

**Example 6.2.5: Eotaxin Treatment of Primary Human Eosinophils and AML14.3D10 Cells Expressing Human Eotaxin Receptor CCR3**

As eotaxin, is a key mediator in many aspects of eosinophil functional biology (Graziano FM et al. *Allergy Asthma Proc.* 1999 May-Jun;20(3):141-6, Corrigan CJ et al. *Clin Exp Immunol.* 1999 Apr;116(1):1-3). Genes which are regulated in eosinophils following treatment with eotaxin might be expected to have a role in eosinophil function.

Human peripheral blood eosinophils, or AML14.3D10 cells, isolated and cultured respectively, as described (Example 1.1 and 8.5), were treated with medium containing eotaxin (1 to 100pM; R&D Systems) or media alone as a control. Following treatment (1h to 18h time points), RNA was extracted as described (Example 1.2).

**Example 6.3: Clinical Study with Peripheral Blood Eosinophils from Normal and Asthmatic Individuals**

This example describes mRNA expression profiling for human peripheral blood eosinophils from normal and asthmatic individuals from a defined clinical background.

Diversion from normal physiology is frequently accompanied by histological and biochemical changes, including changes in gene expression. The up- or down-regulation of gene activity can either be the cause of the pathophysiology or the result of the disease. The comparison of expression of thousands of genes between 'disease' and 'normal' tissues and cells allows the identification of multiple potential drug targets. Targeting disease-causing gene products is desirable to achieve disease modification, while targeting genes that are expressed as a consequence of disease can lead to alleviation of symptoms.

The following groups are identified and clinically characterised:

1. controls normal volunteers
2. atopic non asthmatic volunteers
3. mild atopic asthmatics >80% predicted FEV1

4. moderate atopic asthmatics 60-80% FEV1
5. severe asthmatics (atopic or otherwise) < 60% FEV1.
6. atopic: positive skin and rast test. PC20 histamine, > 2mgs//ml
7. asthmatic: hyper-responsiveness, PC20 histamine, < 8mgs/ml, wheeze, cough,
- 5 bronchodilator reversible, probably atopic.

RNA was extracted as described (Example 1.2).

*Example 7: Data Normalisation, dB Storage and Visualisation*

10 This example describes the process by which expression data (typically .txt files) from Amersham or Affymetrix microarray experiments was normalised, stored and visualised.

*Example 7.1 Data Normalisation*

15 Data was normalised using a number of methods depending on the type of data that is being processed. The first method involves a global normalisation method where the total intensity for all genes on the microarray was scaled to the same overall level to give a scale factor that is used for all genes on the microarray; this is done for all microarrays within a single experiment. This method works particularly well when comparing changes within a single cell type under various conditions or where it is expected that only a small number of  
20 genes will change from experiment to experiment.

The second method involves normalising based upon the use of genes that are known to be invariant under most cellular conditions (house-keeping genes) such as GAPDH (Glyceraldehyde 3-Phosphate DeHydrogenase), actin or certain ribosomal proteins. For this  
25 approach, the levels of the house-keeping gene being used are scaled to the same value for all microarrays within a single experiment giving scale factors that can be used for all other genes on those microarray experiments. This method works well where a large number of genes are expected to change within the experiment.

30 The final method scaled all the expression levels of the genes on the microarray, in each experiment to a common data set, such as that obtained in an experiment performed on liver cells. The genes used for normalisation are those found to be present within the liver, with the exclusion of the top 10% . The ratios of the expression levels of each of these genes are calculated with respect to the liver experiment, the geometric mean taken and used to  
35 normalise the data sets. This approach has the advantage of being used in the large majority of experiments and can be used for cross-tissue comparisons.

**Example 7.2 Data-Base Storage and Visualisation of Data**

The data is stored in a relational database (such as Microsoft Access or ORACLE) that contains the normalised expression levels and a call as to whether the gene appears to be absent or present (Affymetrix only). This data is then associated in the relational database with annotation for known genes from various other DNA and protein databases. These databases include EMBL (GenBank)<sup>TM</sup>, Swiss-Prot<sup>TM</sup>, TrEMBL<sup>TM</sup>, Incyte LifeSeq Gold® and the Derwent patent database. Information that is included is a description of the gene, keywords associated with that gene, tissue distribution and protein function annotation, HTML links to the online database entry, and an indication of the quality of the match between the gene on the microarray and the DNA/protein database entry as measured using Blast (version 2.0.8) statistics.

The data can be queried using the SQL query language in the relational database, where the information for the genes of interest can be extracted. This data can then be visualised using various data-mining software products including SpotFire on a personal computer and MineSet on a Silicon Graphics workstation. In addition to multi-dimensional visualisation, MineSet also has algorithms that can cluster genes according to, for example, similar expression profiles or tissue distributions.

**Example 8: Functional Characterisation**

This example describes how the gene sequences of the present invention can be further characterised with respect to protein structure the function, eosinophil biology and by inference function in other leukocytes.

**Example 8.1: Delivery of antisense oligonucleotides to cell lines or primary cells**

Antisense oligonucleotides of up to 20 nucleotides in length for any single gene sequence are designed as described previously along with an appropriate, inactive, control; oligonucleotides comprising the same nucleotide components but in a scrambled order or by inverting selected sequential oligonucleotides. These oligonucleotide sequences are additionally modified (e.g. methylphosphonate backbone or 2' methoxy modifications) for stability in the molecule. Oligonucleotides are resuspended in water at a concentration of 200µM. Oligonucleotides are delivered to cells in culture using commercially available lipids, for example Fugene 6 (Roche Molecular Biochemicals) or Superfect (Qiagen) or other, as per manufacturers instructions, or by using RPR proprietary lipids. Specifically oligonucleotides are diluted to the desired concentration (1-1000nM) and complexed with the lipid at the manufacturers recommended ratio.

Oligonucleotides are delivered to; primary human eosinophils, or other leukocytes, or other cell lines cultured in TF1-8 - RPMI-1640 with 10% heat inactivated FCS; 100U/ml penicillin and 100mg/ml streptomycin; 1mM sodium pyruvate and 2U/ml recombinant human IL-5  
5 AML14.3D10 - RPMI-1640 with 10% heat inactivated FCS; 10 $\mu$ M  $\beta$ -mercapto ethanol and 1mM sodium pyruvate at 2-4x10<sup>5</sup> cells/ml then incubated at 37°C for up to 7 days. The impact of the antisense oligonucleotide on target gene transcription is assessed by quantitative PCR. RNA is prepared from transfected cells using the RNeasy miniprep kit (Qiagen) as per manufacturers instructions. Levels of target and an internal control mRNA are then  
10 determined using the TAQMAN technology as detailed below. The impact of the antisense oligonucleotide on target protein expression is assessed by Western blotting by standard procedures (Maniatis *et al.*(1989) in Molecular Cloning - A Laboratory Manual, CSH Laboratory Press) The impact of the antisense oligonucleotide on functional biology is described below.

15 Example 8.1.2: Retroviral delivery of gene sequences to cell lines or primary cells

Gene sequences in a sense or antisense orientation are delivered to cells of interest using either of two retroviral systems. The first system, the Phoenix MMLV system (Pear *et al.* (1993) Production of high-titer helper-free retroviruses by transient transfection. PNAS(USA)  
20 90, 8392-6) utilises a Phoenix<sup>TM</sup> packaging cell line (cultured in DMEM + 10% heat inactivated FCS) in order to produce replicative-incompetent MMLV particles containing the gene of interest. The gene of interest is cloned into a packaging vector, for example pBMN (Pear *et al.* (1993)) and transfected into the Phoenix packaging cell line by calcium phosphate precipitation. 20 $\mu$ g plasmid DNA is precipitated with calcium phosphate using the Promega  
25 Profection system as per manufacturers instructions. This precipitate is added to 10<sup>6</sup> cells in 3mls medium. Cells are incubated at 37°C for 5-7h, then the medium is changed and cells incubated for a further 24h. Medium is changed again and cells incubated for a further 48h. The supernatant is transferred to a 15 ml falcon tube and cellular debris removed by spinning at 800rpm for 5 minutes. The supernatant is then filtered through a 0.45mm filter, aliquotted  
30 in cryogen tubes and stored at - 80°C. The virus is then titred to assess the number of infectious particles. Target cells of interest are then infected with the viral particles at a suitable multiplicity of infection.(1-100) by adding the virus in a final volume of 1ml to 10<sup>5</sup> cells in culture medium + 8 $\mu$ g/ml polybrene. The cells and virus are then spun at 2500 rpm for 90 minutes at 32°C. Medium + 8 $\mu$ g/ml polybrene is added to a final volume of 2mls and cells  
35 cultured at 37° C overnight. The medium is then changed and cells incubated for a further 48h. Alternatively, the gene sequence of interest is introduced to target cells using a lentiviral

system developed by Oxford Biomedica Limited (Kim *et al.* (1998) Minimal requirement for a lentivirus vector based on human immunodeficiency virus type 1 J. Virol. 72(1) 811-6). The sequence of interest is cloned into a lentiviral genome vector, for example pH4 or other and this plasmid is transfected using calcium phosphate precipitation as described into an efficient packaging cell line (293T cells) licensed from Stanford University, together with vectors encoding accessory *gag/pol* and *env* proteins such as pGP-RRE3 and pRV67. Virus is then produced over a period of 72h as described for the Phoenix<sup>TM</sup> system. Viral particles encoding the gene of interest are harvested from the cell culture medium as described above then titred to assess the number of infectious particles. Target cells of interest are then infected with the viral particles at a suitable multiplicity of infection (1-100) as described above.

**Example 8.1.3: Quantitation of Target mRNA Levels**

Target mRNA levels are determined pre and post antisense oligonucleotide delivery to cells or cell lines by TaqMan (ABI PRISM 7700) quantitative RT-PCR analysis. Cytoplasmic RNA is isolated using the RNeasy 96 Kit (Quiagen) as per manufacturers instructions with the inclusion of the manufacturers recommendation regarding on column DNaseI treatment. For each treatment, 10µl of the resulting RNA is reversed transcribed using the TaqMan Reverse Transcription Reagents Kit (PE Applied Biosystems) as per manufacturers instructions. 5µl of this is added to a 25µl final TaqMan PCR reaction mix (TaqMan Universal PCR Master Mix, as per manufacturers instructions). Target RNA quantitation is carried out using the relative standard curve methodology as described by PE Applied Biosystems and normalisation is carried out using a reference gene, for example GAPDH. Target RNA TaqMan primers/probe sets are designed using the PE Applied Biosystems Primer Express Software.

**Example 8.2: Functional Assays**

The impact of the genes described on functional biology of eosinophils, other leukocytes and model cell lines is evaluated by monitoring the impact of such genes on a number of functional biological and biochemical assays. Assays (for example adhesion, apoptosis, or calcium mobilisation) have been configured which are characteristic of the primary eosinophil or other leukocytes, in both primary eosinophils or other leukocytes per se, and in cell lines (for example AML14.3D10 (Baumann *et al.*, Stem Cells, 1998;16:16-24), TF1.8(a gift from Prof. C. Sanderson, Institute for Child Health Research, Perth, Australia), HL60 (Tomonaga *et al.*, Blood, 1986; 67:1433-1436) and EOL-1 (Mayumi, Leukemia and Lymphoma, 1992; 7:243-250)). Potent antisense molecules that knockdown target mRNA

levels are identified (see above) and transfected into an appropriate cell line, for example AML14.3D10, and a functional assay is performed (for example an adhesion assay or an apoptosis assay) at an appropriate time post transfection, for example 72 hours. Assays are performed with the appropriate scrambled control antisense oligonucleotide simultaneously, as an control. Similarly assays are carried out using cells in which candidate genes have been delivered in a sense orientation to evaluate over-expression or in an anti-sense orientation to identify any anti-gene effects.

*Example 8.2.1: Adhesion assays*

Adhesion assays are carried out using cells or primary eosinophils and looking at adhesion to a variety of substrates including plasma fibronectin (100µg/ml) cellular fibronectin (100ug/ml) coated on tissue culture plates, or to primary human endothelial cells. In a 96 well plate, 100µl of a 100µg/ml solution of fibronectin is added to each well, and equilibrated for one hour at 37°C. The wells are washed with PBS/1%BSA (bovine serum albumin) and then blocked non-specifically with a solution of PBS/1%BSA for one hour at room temperature.  $2 \times 10^5$  cells in Puck's Buffer (Pucks Buffer (Sigma) /0.1%BSA / 2.5mM  $MnCl_2$ ) are bound to fibronectin coated plates or to confluent endothelial cells for one hour at 37 degrees celcius. Unbound cells are washed off (3 times) with RPMI containing 1% BSA and the bound cells lysed in mammalian lysis buffer (Promega) as per manufacturers instructions. Quantitation of bound cells is carried out using PicoGreen Nucleic Acid detection (Molecular Probes) as per manufacturers instructions. In this way genes are identified that enable or inhibit adhesion beyond the normal range and such genes are therefore implicated in the regulation of the adhesion process.

*Example 8.2.2: Apoptosis Assays*

Apoptosis assays are carried out using primary eosinophils or other leukocytes or cell lines including TF1.8 and AML cells. Apoptosis is monitored by caspase 3 activation or annexin V externalisation. Caspase 3 activation is measured using a CaspACE™ kit (Promega). Cells are harvested following antisense or retroviral treatment and pelleted by centrifugation (8000rpm for 5mins) Cell pellets are lysed using lysis reagent and caspase-3 enzyme activity monitored by production of a fluorescent substrate using a fluorescent plate reader as per manufacturers instructions. Annexin-5 is measured using the ApoAlert™ Annexin V apoptosis kit (Clontech). Cells are harvested following antisense or retroviral treatment and processed using an Annexin5 detection kit (Clonotech) as per manufacturers instructions. Cells are then fixed in 2% paraformaldehyde and analysed by flow cytometry.



**Example 8.2.3: Chemotaxis assays**

Chemotaxis assays are performed with eosinophils or other leukocytes or cell lines as described by King et al, J. Leuk Biol, 1997;62:465-8.

5

**Example 8.2.4: Activation Assays**

In response to a range of stimuli eosinophils and leukocytes generally will be activated in a number of ways as specified below.

10

**Example 8.2.4.1: Eosinophil Peroxidase**

EPO assays are performed for the measurement of EPO release in response to activation.  $5 \times 10^5$  cells are incubated in HANK's buffer in the presence of activator, such as Histamine for one hour at 37°C. The supernatant is harvested and EPO concentration is determined by the method of Strah et al (J Immunol Meth, 1985; 83: 209-15).

15

**Example 8.2.4.2: Respiratory burst**

This assay is carried out using lucigenin as a substrate. Cells are cultured in a six well plate at  $5 \times 10^6$ /ml/well in standard medium. After a 24hr cells are washed three times in HBSS with calcium (Sigma + BSA (0.2%), HEPES (10mM), sodium bicarbonate (7.5%)) and seeded at  $5 \times 10^4$ /well into a white microlite microtitre plate containing pre-warmed lucigenin [50µM]. Cells are incubated for a further 30 minutes in a luminometer (ML3000 Microtiter Luminometer, Dynatech Laboratories) prior to addition of a prescribed stimulus at time zero.

20

**Example 8.2.4.3: CD69 Expression**

CD69 expression is employed as a marker of activation.  $5 \times 10^5$  cells are incubated overnight in culture medium plus activator, for example Histamine. After overnight culture, the cell suspensions are centrifuged and the pellets are resuspended in cold RPMI-1640 (Sigma) and placed on ice for immunofluorescence staining and flow cytometry. This was performed as per Hartnell et al., Immunol, 1993; 80: 281-6.

25

30

**Example 8.2.4.1: Cytosolic calcium**

An elevation in cytosolic calcium is measured using a fluorescent calcium indicator dye such as Fura-2, Fluo-3, etc (Molecular Probes; Kao (1994) Meth Cell Biol 40 155-81). Calcium mobilisation assays on antisense treated or retrovirally targetted cells are carried out in two formats following loading of the cells with a fluorescent calcium indicator. For example cells in assay buffer [HBSS with calcium (Sigma + BSA (0.2%), HEPES (10mM), sodium

35

bicarbonate (7.5%)]( are loaded with 3 $\mu$ M fluo-3 AM for 45min at 37 °C . Loaded cells are then washed three times and harvested into a 96-well plate (0.5 x10<sup>6</sup>/300 $\mu$ l). Agonists are micro-injected into the wells and change in fluorescence measured using the FLUOstar®(BMG Lab Technologies). Alternatively cells are monitored for changes in calcium in a Perkin Elmer dual excitation spectrophotometer using single assay cuvettes.

Other activation assays that may be employed to assess the impact of genes of interest include the use of a microphysiometer [Molecular Devices] to measure proton extrusion from the cell, eicosanoid production including prostaglandins and leukotrienes [measured in cell supernatants by ELISA or other immuno-assay]; and the production of known cytokines.

10

*Example 9: Antibody Production and Immunohistochemistry*

15

Anti rabbit polyclonal peptide antibodies are produced to targets based on predicted peptide sequence and tested for their ability to react with protein via ELISA assay and by Western Blot using whole cell extracts (Maniatis et al (1989), in Molecular Cloning, A Lab Manual, CSH Laboratory Press, Second Edition). Reactive polyclonal antibodies are used to carry out immunohistochemistry on a wide range of human tissues and to compare the expression of a specified gene in diseased versus normal, tissues, for example in asthmatic lung versus normal lung or in any other inflammatory disease tissue.

**CLAIMS:**

1. A polypeptide encoded by a polynucleotide according to any one of Seq ID Nos: 1-466 or a fragment the polypeptide.
- 5 2. A polypeptide variant having at least 90% amino-acid sequence identity to the polypeptide sequence of claim 1, and sharing at least one functional or structural characteristic with the polypeptide sequence of claim 1.
- 10 3. An isolated polynucleotide which encodes the polypeptide of claim 1 or 2.
4. An isolated polynucleotide comprising the polynucleotide sequence of any one of Seq ID Nos: 1-466, or a fragment thereof.
- 15 5. An isolated polynucleotide variant having at least 90% polynucleotide sequence identity to one of the polynucleotides of claim 3 or claim 4.
6. An isolated polynucleotide which hybridises under stringent conditions to one or more of the polynucleotides of claim 3, claim 4 or claim 5.
- 20 7. An isolated polynucleotide which is complementary to one or more of the polynucleotides of claims 3 to 5.
8. A method of screening for agents which modify the activity of one or more of the polypeptides of claims 1 or 2, comprising the steps of a) exposing the polypeptide to at least one agent to be screened; b) detecting and/or measuring interaction and/or binding between the polypeptide and the agent.
- 25 9. An agent identified according to the method of claim 8.
- 30 10. An expression vector comprising one or more polynucleotides according to claims 3 to 7.
11. An expression vector according to claim 10, wherein the polynucleotide is operatively associated with an expression control sequence which permits expression of the polynucleotide in a host cell.
- 35

12. A host cell comprising an expression vector according to claim 10 or 11.
13. A method of producing a polypeptide encoded by any one of the polynucleotides of Seq ID Nos: 1-466, the method comprising the steps of a) culturing a host cell of claim 14 under  
5 conditions suitable for the expression of the polypeptide from the polynucleotide; and b) recovering the polypeptide from the host cell culture.
14. A method of producing a polypeptide encoded by any one of the polynucleotides of Seq ID Nos: 1-466, the method comprising chemical synthesis.  
10
15. A method of producing a polypeptide encoded by any one of the polynucleotides of Seq ID Nos: 1-466, the method comprising a) transforming an animal with an expression vector according to claim 10 or 11; and b) recovering the polypeptide from the transgenic animal.
- 15 16. A pharmaceutical composition comprising one or more of the polypeptides according to any of claims 1 to 2, and a pharmaceutically acceptable vehicle.
17. A pharmaceutical composition comprising one or more of the polynucleotides, or fragments thereof, of claims 3 to 7 and a pharmaceutically acceptable vehicle.  
20
18. A pharmaceutical composition comprising a vector according to claim 10 or 11 and a pharmaceutically acceptable vehicle.
19. One or more polypeptides or fragments thereof according to claims 1 or 2, for use in the  
25 treatment of eosinophil mediated inflammatory disease.
20. A pharmaceutical composition according to claim 16 for use in the treatment of eosinophil mediated inflammatory disease.
- 30 21. Use of one or more polypeptides or fragments thereof according to claims 1 or 2 in the manufacture of a medicament for treatment of eosinophil mediated inflammatory disease.
22. Use of a pharmaceutical composition according to claim 16 in the manufacture of a medicament for treatment of eosinophil mediated inflammatory disease.  
35

23. One or more of the polynucleotides, or fragments thereof, of claims 3 to 7 for use in the treatment of an eosinophil mediated inflammatory disease.

24. A pharmaceutical composition according to claim 23 for use in the treatment of eosinophil mediated inflammatory disease.

25. Use of one or more of the polynucleotides, or fragments thereof, of claims 3 to 7, for use in the manufacture of a medicament for the treatment of eosinophil mediated inflammatory disease.

26. Use of a pharmaceutical composition according to claim 22 for manufacture of a medicament for treatment of eosinophil mediated inflammatory disease.

27. A pharmaceutical composition according to claim 18 for use in the treatment of eosinophil mediated inflammatory disease.

28. Use of a pharmaceutical composition according to claim 18 in the manufacture of a medicament for treatment of eosinophil mediated inflammatory disease.

29. A purified antibody capable of binding to any one of the polypeptides of claims 1 or 2, or fragments thereof.

30. A kit for diagnosis of disease characterised by inflammation, comprising means for assaying expression of a polynucleotide or polypeptide according to any one of claims 1 to 7 in a sample of eosinophils from a patient.

31. A method of modulating apoptosis of eosinophil cells in a subject, comprising administering to the subject a polynucleotide according to any one of claims 3 to 7, wherein said polynucleotide sequence is operably linked to a regulatory sequence.

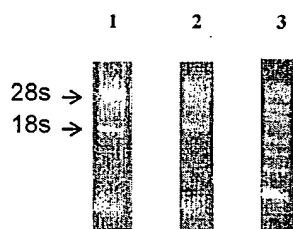
32. A method of diagnosis of disease characterised by inflammation, the method comprising a) obtaining a sample of eosinophil cells from a patient; b) assaying said sample for levels of expression of a polynucleotide according to any one of claims 3 to 5.

**33. A method of diagnosis of a disease characterised by inflammation, the method comprising a) obtaining a sample of eosinophil cells from a patient; b) assaying said sample for levels of a polypeptide according to claims 1 or 2.**

**34. A method of inhibiting eosinophil migration in a subject, the method comprising**  
5 **administering to the subject a polynucleotide sequence according to claim 6 or 7.**

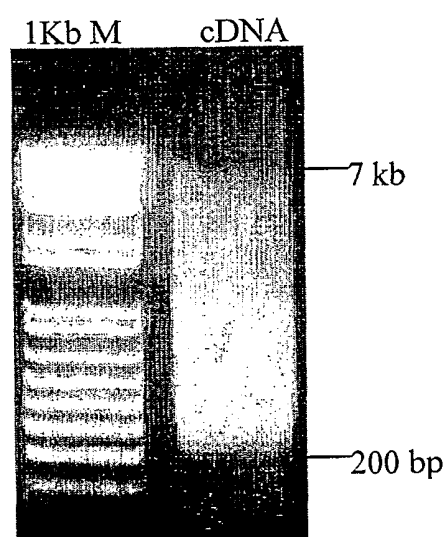
**35. A transgenic, non-human animal comprising a recombinant polynucleotide having a sequence according to any one of claims 3 to 7.**

**36. An agonist or antagonist of the polypeptide of claims 1 or 2, wherein said polypeptide is a receptor.**

**Figure 1**

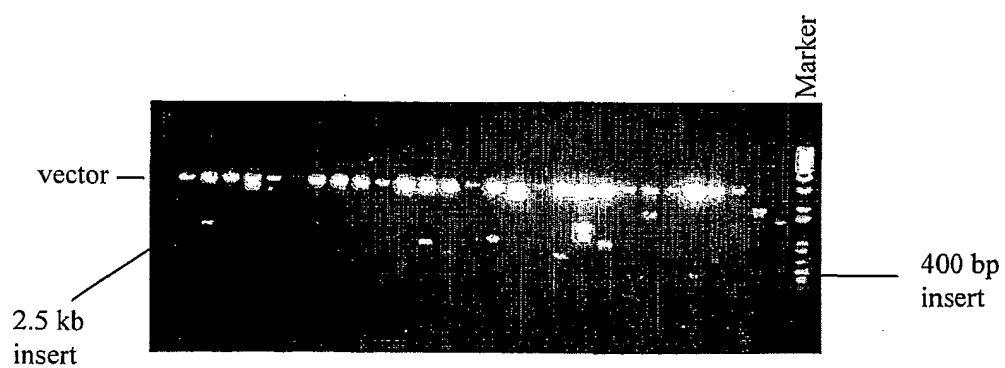
Gel analysis of RNA isolated using the RNazol modified methodology.  
(Lane:1 Eosinophils, Lane:2 Neutrophils, Lane:3 Molecular weight marker)

**Figure 2**





**Figure 3**



5

**Figure 4**

AscI  
\_\_\_\_\_  
**5' AAGCAGTGGTAACAACGCAGAA-GGCGCGCC-T(18) (A/G/C) 3'**

NotI  
\_\_\_\_\_  
**5' AAGCAGTGGTAACAACGCAGAA -GCGGCCGC-GGG 3'**

**Figure 5**

5' -        GGGCGCGCCTTAATTAAG        - 3'  
3' -    ACGTCCCGCGCGGAATTAATTCTTAA    - 5'

## SEQUENCE LISTING

<110> Aventis Pharmaceuticals Products Inc.

<120> Polynucleotides and Polypeptides

<130> 40/165/P/WO (CA2444  
)

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<170> PatentIn version 3.0

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<211> 671

<212> DNA

<213> Homo sapiens

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tggttactctt t

671

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&lt;211&gt; 671

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 2

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atctcccgag gatgtctcct ggactaagtg ttcataatta tgtcactcac cgcgaagttg 600
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&lt;210&gt; 3

&lt;211&gt; 493

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 3

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catccctgaa aactatctcc ttttcacact aaatattgtt aaatcattcc aaagtaaact 240
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 ctgagtcaga ggcagacgtc cttctgtggt tattcgcttc ctgtctgatt aatttggtgt 180  
 ttgttgttcc ttcctccttt gctgcagaaa aagaaactag attggttttg cttaagaagc 240  
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 caactttatt ctgatatttc ccacaaaaat aactgttcat ggaacttgag attccttttag 420  
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 agagtcactc aagaaagaaa agctcttacc taccttacct tatcgcttca ttaggctaag 540  
 ggcttcttct catttacagg gcattcaagt gtgtggggag aaagttacaa atgcaggtaa 600  
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<211> 624

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<213> Homo sapiens

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tgtgggaaga ggtgaaggtc tggaggcttc tgaccttcca ggattcatgt ggatgcotta 240  
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 tattactaat tagttttggt ttaagcatat caacttattg ttaatcattc atacaggagg 360  
 ttacaaaagg aaaagtcaaa gctgtttttg ccaattctat atctaaccac ctagtccctac 420  
 tcagctgtag aatatgttac aaaaactctc agaagtgcctt ataggtatca agcattatatt 480  
 cttctgtctg cttattatgt atttatataa gactattgac ttatttatat taattttgta 540  
 tgctacctct ttaccaaatt ctcttattat ttatattaat ttctccattt acttttgttt 600  
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<210> 6

<211> 512

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<213> Homo sapiens

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 aatagagtat tgcttcttca gctaagtatg cttttgttaa tagccacatt tcttctgctc 180  
 tgggttaagc taggtacatg caattataaa cttttgtgt cccatagcaa gagcagtttt 240  
 ccttggaat caccgagacc ctcaattttt tttgcaagga aacttttata ggctaattca 300  
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 gaaaaaaaaat tagccgactg tggcctcatt aactgcacct ctttcggcaa atttgatttt 420  
 gcatttcatt ggcgattttt acatttttga taatctacat gttttcaaaa aattgatttc 480  
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<210> 7

<211> 673

<212> DNA

<213> Homo sapiens

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gcctgcaact gcacacctcc ctttctgggg ctgcattttct ttctcctgta tccagtcctc      240
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tttggaatc tcagtaccac ttactagta ctttgaggga cactgttcta aaaggcacag      540
cctgggacca tacttgtcac agcaagtttg ggctcatgcc ctgagcatgt accaaccgcc      600
caagggtaca cacgtggctg gtctatccc cactctctct ttgtttctgg acttgttttg      660
ctttgttttg gtt                                     673

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&lt;211&gt; 410

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

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ttaaactaag gaacgtatta aaattcatct ttgtataacg tccaataatt taggactctg      180
attcactgac caaaagtcag tgttgcagag atttctctac cccgtatggt attttgtag      240
attgttcaac actgaagcac atgattgaga acatcttggg acagaccaa accactgaca      300
tatgggaaag acagatgcac cttatttcct tctaaaatt tgatggagaa taagattctc      360
tacatactca ctgtacccat cctctttcag tttgctgtta tcatctgtat      410

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&lt;210&gt; 9

&lt;211&gt; 638

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;



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 taacttaaaa atgacaaaaa aaaaaaaccc atccttctat aaaatcatct aaagatctaa 180  
 aggtagaagt tgcaggggag agggataggg gaaaatacaa aactatccgc tagtttgctt 240  
 aatttggaag ataactccat aaataaatat ttgcaaagga tagtcaactc ttgacccttg 300  
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 tctaattgtga aggaagtaat ttttctcaat gcctatcacc ttaaaagcca tttctttcat 480  
 cacaaaaaaa tgaaagtagc agctaccag caaagaaaag gaaaccaa atcacattttgt 540  
 aacctagcct aatttacttc tacacaacag aaaaactgat cctgcactct cttctctcct 600  
 agtctcctcc tacaaaatag catctccctg ttaaagtc 638

<210> 10

<211> 611

<212> DNA

<213> Homo sapiens

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 ttcacgtgca gccgcagagc tacaggagtt tggtcgtagg ggcagcactg cagagcctct 180  
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 gtgtgctgtg atgtgtctcc ccaggctctg ccaccactcc agtgcaccaa actgctgctg 360  
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ctgctgcagt actactctct ggtctgccct ggaaaaaccc agaagcatat tgcattcacag 480  
cttgagaaat tacatctata gggggagcag ggagctagat accaagaata ccaagaatat 540  
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gcctgagctg t 611

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<211> 644

<212> DNA

<213> Homo sapiens

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caagaatcct cttgattcat caggctacaa tataactcgg cctccagcaa caacttaatg 180  
tatcaaaatc agaaatatac gtacacgatg cagcgactgg ctgagggtg tagcattact 240  
atcattggga acactatttc gtcaaaactgt aaagtgaag caaactgggt tcctgacctg 300  
aatttcattg aagtctaaac aactccatta ctgtacacag gagtcgcccc aaacaaacat 360  
cacacatctc acttctgcct cagcaacggc ggcgaccctg ggttccccta cagagatcag 420  
aggagaggag aggacaggac acagccccac cctcttgcca aagggtccac agccgtttcc 480  
acaggccaag tgtttccccc tgatcccaga ctctcgcgcc gctgtgggac ggaactacag 540  
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<211> 612

<212> DNA

<213> Homo sapiens

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tccagccatg cttttggtgt ggattttaaa gccaaagacct ttttcaatga gaaccacagg 180  
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cacgtggagg ctttacttcc ccactttgaa gtgctgctga gctattttac ttctaataccc 300  
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 cggatgcacg tgcccacaca ctcatTTTTca ttttactggg ctcaacaccc totaggttgt 540  
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<210> 13

<211> 731

<212> DNA

<213> Homo sapiens

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 tgacagttgg cagaggtagt gataagaaag attagcaaag ctccaaacca gaaacaatct 180  
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 aggcagccac tcaactctgac cagacacctg aagccattga ctcatgtaca ggacacatta 660  
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<211> 752

<212> DNA

<213> Homo sapiens

<220>

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<400> 14

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gagacttatg cattgggtaa caaggcactg caagaaacc cagatagcac agcatcatct      180
cacatttaca ccacatcaca tcaacatcga tgctaggagg tctaaagctg nnnnnnnnnn      240
nnnnnnnnnn nnnntccaaa agactccact catgacacca gtcactcct gagtcacatc      300
agcccctttc agagtcacag cccagaaact aaggctatcc atatgggttg attatacaat      360
ccaaaaagca gtcctaaata ttagaaacac ttatttgtct ggagacaca ttccctaatt      420
taaagcctct tatactgtgc ttaaaaatat tcaacagtct tagcaaaatg acaaaataaa      480
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ctagcctaga agaggggagg agaagcagaa gacagcaagt gaagagcttg aagaacttga      660
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<210> 15

<211> 677

<212> DNA

<213> Homo sapiens

<400> 15

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ttcttgacct acttggtgaa gtccgtttta tcaggatatt attgcagttt ggggtgtgaga    120

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tcacagccag gagccagcga gtctgcaacg ctgcctgcga ttccccaagt gctgaatagg 180
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agttgtggct ggggttgaaa ccagacttgc tgaacttcaa agtcaagctt tttttcccc 600
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<210> 16

<211> 1157

<212> DNA

<213> Homo sapiens

<220>

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<400> 16

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ccccttaatt ttaaagatga ctttgaaggt acacttgtga agaaaagagt taatctaggt 180
caacactctg cagtagaaat ataattaaaa gtcaatacct taatctcttc taaattgaag 240
ggccacgata tattacatcc ttcactttta tcgggcctgg aaattcaaat ttaaaagaga 300
aaataagaaa tattaggctt ggttgggggtg gcttctacat gaccttagaa aacactttca 360
ttgaagtctg caaagaataa aaagagaaat tctaattggg aattccttat ccaggcagg 420
atgcttaaga aggaagacgc aggtaagagg agtcagagtt caaatttctt tagaagggaa 480

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aagaaattgt gttaaaccgt ccaggagtaa tgcagacagg ccactgctta gtaaaggaag 540
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tgacggcaac ctctgctgct ccctagcacc gagacctaag taagctgacc cccggccaat 660
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<210> 17

<211> 548

<212> DNA

<213> Homo sapiens

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gaacaattag agccatcaag gtattctggt aaaaatattt aaccttgat gtaatgtata 180
ttttcacagg ttttggaac gttgtggaac ttgcacatcaa taccaagggt gttgggggaa 240
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ttaaatggta tttatgcaaa gaataaagat ttgttagttt gcagatcatt ttaaattttg 480
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<210> 18

&lt;211&gt; 647

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 18

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cgagcaactg aaaaagaatg ttttggcttt aaaaaaactt ttttgtactt agtaatatat      120
acagtaattt tataattgac tagaagtatc aatgttcaaa gaagttgtag actataaaaa      180
tatgacctct ggcatgcaat tctcaaaaac atacaaaatc ttctttcttg gttggatttt      240
tacaacatc tctacatgca acagttgagg ttaacctttt atacagcctt tggaataaat      300
tagtaatctg tagtgccttt agaagcattt ttatatTTTT tacctctgtg gaaaagcatg      360
taaaattgtt cactaaactc aactcgtaat ggtccacacc aagagattaa tgaggttgag      420
cctgtcaaca ggattgactg gtttgtccat ggatatTTaa tgaactggat tcaatccagc      480
tagtgctgca aaaaagaaaa cacaccttgc ccagccaatc accttgaaca gccatttcat      540
gttggtgtgtg tgtgcttctg cgtcttttat cacaactgga agaattgagga tttgctagtg      600
attagtgatg gcgcggggag agtaatcacc gcatgctgag gtctgct                      647

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&lt;210&gt; 19

&lt;211&gt; 635

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 19

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gggctgagac ctctggcact ggcagtagac ttatacaggc aaagaagcca aaacaatgag      60
ctcatgggca agaatgcagc ctgtggggaa gtctgggcag ctagagcaaa ctggtttttt      120
gaatcaggat gggaatagca atagttgagt ctcccacggg aacaggatca gggagagtgg      180
aagccaccat tcagtatctt agggttccag ttaaataact tttggaagct cttattaaaa      240
ttctgttctg cagacagcat agtgctctta ggcaaaacct tggttccttt ccctgactat      300
gtaaaacctc gggggtgaag gaccagttag gctccagtga cctaccttag gtgatgctct      360
taaaagagca actttattca aaccaggcct gccaatgcc aactccttcag tctagatcca      420
aagatggcta tgatcctgag attgtgtgtt tagggtcacc actttaacat gatacaggaa      480
gcaattgggt cttttctact tcctaaacac agtccatcca gttgtgtgtc atttataccc      540

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agtccagact tatttagacc aaagagcctt ttttccctat cagtgttttc caaattttat 600  
cttaagaggc agggctcttgt tatgttgccc atgct 635

<210> 20

<211> 736

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 20  
gggggcacat cctggggacg aaccgggcag ccggagagct gcggccggcc cagtcccgc 60  
ccgcctttga agggtaaaac ccaaggcggg gccttggttc tggcagaagg gacgctatga 120  
ccgcagaatt cctctccctg ctttgccctg ggctgtgtct gggctacgaa gatgagaaaa 180  
agaatgagaa accgcccaag ccctccctcc acgcctggcc cagctcgggtg gttgaagccg 240  
agagcaatgt gaccctgaag tgtcaggctc attcccagaa tgtgacattt gtgctgcgca 300  
aggtgaacga cnnnnnnnnn nnnnnngaac agagctcggc agaaaacgaa gctgaattcc 360  
ccttcacgga cctgaagcct aaggatgctg ggagg tactt ttgtgcctac aagacaacag 420  
cctcccatga gtggtcagaa agcagtgaac acttgacgt ggtggtcaca gataaacacg 480  
atgaacttga agctccctca atgaaaacag acaccagaac catctttgtc gccatcttca 540  
gctgcatctc catccttctc ctcttctctc cagtcttcat catctacaga tgcagccagc 600  
acggtgagct cagagaacgc aaagggagag agggggagtg aaggattttc tcggtaggta 660  
aattcctcct gcattttttg taggttcac c atctgaggaa tccaccaaga ggtagatgct 720  
tggcatagct catgct 736

<210> 21

<211> 520



&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 21

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gggcatgggg aagggggtga ctggagattc tgtggtctgg aaaggcttcc ttgaggagat      60
gaggtgaggg gtgtccttct ggatggattt ctgttctggt ctatggattt gctctgatca     120
aactaagttc agtgataaac aggacagaaa tgtgctcaac agtaggagaa agagaaggaa     180
tgaatggcaa agaaataagt cagacatttc acatagcaag agatcagagg ctacggccag     240
agttaaaaat ccaaagatca caataagtaa tgagagatga gaggctgcct attaaaactg     300
ctgtttctga ctctctgtgg agaaatatca acactttctc tcctcctgcc cctcttcttc     360
ctttctgttt ctctcaggct acactgacat agaatgtata gcagttaatt gaaattattt     420
gatttttgtt ttaaacagag gttgcttgtt aaaataagcc acaagaggga ttttggttaa     480
gttattgatc tcaaacataa atgttttcct tgtagataac                          520

```

&lt;210&gt; 22

&lt;211&gt; 634

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 22

```

aacattttga aaatacgtgc tatctaaatt tccctcttct ctcaaagatt gaatttaaag      60
ggcattgtta gaaagatcgt aagtacatgg tcatataagc aaaatcctga tttgtatggg     120
tttttttggg cagcaaaaaga tacaagcaac aagtaaggga tttcataaat ctggacaggt     180
tatgcataac tcaagacaga aaggaagtgt ccaactctacg ttatccaggc agaaaaaaat     240
acacgtatca acccagggca gctttcatat tctgctttta agtgtatttg aatctattgg     300
gccgtgaaga taaactggga agacaacaat agcaagttca taataccaag aacgtgcact     360
ttggggtaag ttattaaagt tgactcttct aagaaaatac tgcaagaaaa tcacagttag     420
gaaggggaac aaattcttag tagtttataa aactcaggta taatattgat ttaatcaaaa     480
ggcaaaaactg gagcaaaaaga atagtccctgg gcacagtgtc taaagcagac acaccttaaa     540
ccaactttgg aatgccttat gattcatgtc tcaacatgaa cagtttcta cacaagggaa     600
ccttctccaa tgccctctga gcagtagtaa aata                          634

```

&lt;210&gt; 23

&lt;211&gt; 661

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 23

```

gggggggggg ggcaaactga taggctaaat atgcagcaaa gtcacttgcc aaaggaaaat      60
gctctgaaga gcttgtaatg ccttagagat ttaaaagatt taagttgtag ggtaaaataa      120
taaatttgta tgggtaaact aatgaaaagt ttaacaatc tactgtaaaa agtttatttg      180
caactctaac ttcttagaat gtttaataaca attagcacat taatatacca cacaggtaca      240
ccaaaactta tgtttaaaaa gtttatttta aaaatctaa; tatagtatca acacatagct      300
catgataaat ttggaaaaca tagaaaaata ggataaagaa cataaaaaatc accaattgca      360
gcacccaaat ataaccactg ttagcatttt gttgtaaaact tccttattct tttgctttct      420
atgcacatgt ataaatataa atgattaaac aaacctcaaa gttttccaca taaagagttc      480
tgtatcctgt tttctaaatc tgatattata taatgtacaa tttcctatgg cactagacat      540
ccttcaaaat catgatttta atgcctgtgt tatagtctac ctgagagaca tcttatttat      600
tctgaacatt ctgctcaaa aatcactgac attttttcta attatttttc ttgggaacaa      660
t                                                                                   661

```

&lt;210&gt; 24

&lt;211&gt; 529

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 24

```

gcgccgcggg gaaactgaga gccattttac tataggagat gcaagccaag caaaagcaga      60
tttcctgagc aaggatgtct caaggacat ctcataacac atcacaggat tagcagagtt      120
ctcaaaacag taatagatgc atttctatca cctgaaacag ctgacagaaa aaaaaacatg      180
gaggaaacat gttgcaaatt ttctttatac tctgtcaagg gttttcctcg ggacacagct      240
tcatgagagt tctatgctca cctatttaac cacctctggg aacaaaagga caggaatgag      300
tacatgcaac acaaaactact cccattccac caaggcgtct acacttactt gctcatctcc      360
caaccacca tctgggtgag gaagggcaca gtggatgtga caatgaggat gaaaacacgt      420

```

ggtaggatgg tggaggcggc cagaagaggc agcattggtc tggctcttcc tgattgagaa 480  
 catcaatcca aggcattcagg cacctctcct ttgctcttct ctccttctc 529

<210> 25

<211> 632

<212> DNA

<213> Homo sapiens

<400> 25  
 ggggtgaggtc tcctgatgga gcagtagatt ccaatactag taacctataa tgagaagaca 60  
 aggaagggtgg cccctagtta tttcttgacc atgtccttgg ccagaaagac tggccaacag 120  
 aagccagagg agtgggtaga tgttcaggcc tctactcaag ttcagcaagg gctggtacag 180  
 ctatactctg ctgtgtgggt gcaaaatacc tagatttttt ggactactaa ttgtttgcta 240  
 ataataactg ttcattacccc aaaccttggt agttgttcat caccctaaacc taagagattt 300  
 tctttcttta gcaccattca gaaaattaca atattcaaataa aaattaagat acgcaaacac 360  
 cgaagaactt ttaaacacag gtcttgatgt ttacctacaa attttgaatt ctatgactca 420  
 aaaaataaat caacagaaac tgatagtga atggatattt aagactgaga tcacagtcag 480  
 gaagcagtga gtacttaaga tgaataagct taacctattt aaacataaaa caagaaggga 540  
 agtaagacaa aaattacctc ttttccatcc attcatactt tctgaacaat tagtttctta 600  
 tgactccagg aatttgacat tagactatgt tc 632

<210> 26

<211> 568

<212> DNA

<213> Homo sapiens

<400> 26  
 cagcgagatc atcaaaactcc acaaaaccat atctttgtcc taaaactgtg ccacatgctt 60  
 ttctttgtat gtggacatga cagtcctcag ccaaccatca gcaggatgtg agttttgttt 120  
 tcacaatgtg gtgagccatt cccacattca ctcatcttcc ttgtaagaac cgaacctctc 180  
 catggctggg caggattagg gatgttgccg tgctcactga gtggcagagc tgggggtgcga 240  
 cttcagggct caccattacc cagtcctggga ctcttttcac gtcggcaaac tggcagttcc 300  
 cgcacaccaa gggctctctg attagagcta gtgtggattc ctgggtctgca aacgttggcc 360

```

acagctcagt ctgcattga tctttcccca ccttggggca gggagaagca cctctaagct    420
gggggatatgt gacaaccagg ttactttcac tcgtcttttg gttcccatta gccagtgtea    480
gccatctggt ccttccgaaa acatgtgtgg gttcagaaca taacagactc ttaaacaaca    540
caatgagcag gctgccaggt gttaaagc                                     568

```

<210> 27

<211> 695

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 27

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ggggaattca aggaaggtgg ccattctgat atcatgaaat ccactttcag gctaattccc    60
atataataca gaatttcaaa tatctacaaa cacaaggaca gaaaatagga accatgatat    120
ttggtccctt ttaggattga gacatcctac ttctaactta atactcctgg ggtcccccg    180
gcttcatnnn nnnnnnnnnn nnnaaaatac agctgaatat actgaaatta gttagtgatg    240
tcaattacac tgaaagtgtt gattgacact ttcagttgtt gaaaacactt tcagtgtagt    300
tgatatcact aattgagact gagaggttga ggagcccttc agagccagcc attccacact    360
taagtcattt ttagatatca tatgtagttc ttattacaac cccaaaatag gaattattag    420
attcttcaaa tccagtcttt atacgatttc ctgagaaacc actocaaaaa cattaccca    480
aacacataa agagtacttt atctttcaaa atattctatt tgcaacctca cagttccttc    540
ctaatagttg tccactataa ttaagccaaa gaaaaaagct catgttcact ggcttatcta    600
atgtcttaag agatacaata aatttaaagg attagatata attagagaaa atttgatata    660
acaataaaga ttccatgccc attttcagag aatat                                     695

```

<210> 28

<211> 761

<212> DNA

<213> Homo sapiens

<400> 28

```
gggacgtttg acgtggtgtg gccactttac gttttcaagt ctatgagaat gtctgcgcgg      60
agacagcata gctctgtaga aatgagtggc agcgtatgta acctggcatt ttgaaccag      120
gagcacaatt ttattaaagg aaaataaacc tactttctca ttgataaacac tgttttttag      180
ttttatgggtg aactgttcgg aagtaatfff caacaagtgc ttattttata aatattagac      240
cgtgtacccc taggattgtg tattttttga gaaaactggc ccatagaagc ggtgcaaaag      300
ttttaaactc atctgcctcg gatcctcctc ctctgagcag atgctcaatt aaactttttc      360
tagtatctta ataattggag gtattaatag atgtttttatt ttgagatac atattgtaca      420
ttttagatct tttttttttt ctaaagtagg gatccaaaat tgagggtgaaa tatatttgct      480
tacatggcaa gactttttta aagtagaatt tctgtaattg aagaccatcc ttttttgtgt      540
gtgaatagaa tggttgcggt ttctcttggg atcattgatt agtgaattac gatttggtta      600
agatagaatg cgtttttagg aagttggagg ttgactaat cgctgtgtta gcatatgagt      660
aacaaatttg aagaagatac aagcattttt atggctgacg tttctaata gataatttta      720
tttttaagct tgctctgttt tacttttggt aagtgaacat t                          761
```

<210> 29

<211> 557

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

```

<400> 29
gggggagaaa aaaaagccat tacactcagc taactcctaa agtgtagtta ttgagcttac 60
atagaaaatc cttgtagcca catagtcttc aactgatgac aggatgaaaa gaccttcttt 120
tgcctaccaa actgccaaat ccaaggcctt tgcaggaaag aagtgtgat aatacaagta 180
ttactcttgg agaaaaggaa tactcagttt caatctcata tttgaacaag gtatatccca 240
aataatcagg agtatttagc aaaatgcaat catgttaaaa tgtatttcac ttacctgttt 300
cctcaaaaac atttgttaat tcctttgagt gcaccnnnnn nnnnnnnnnn nnnnnnnnnn 360
nnnnnnnnnn nnncaagtaa aactgaaatt aattttattt cctttttttc ttaagtaaa 420
gaaactatgt tatctcccaa aaagctctta gaggaattct actaaacatt tatggcaaaa 480
atattgtac tattttaaaa tgtccagag cccactggaa gagagaaagc tgctaactgc 540
cttttataat cagtctc 557

```

<210> 30

<211> 581

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

```

<400> 30
gggagacagg cgggcttctt ggtagatat gacaggaaca gcctcttaga aaagtgatgt 60
aaagtaaata taaaggccct agccctccag gcaagacgga atagactctt tgtggcaata 120
agatagcaaa ttatgnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn 180
nnnnnnncct cgttccatgt ccttctatgt taaaccatcc cccaaatggg gtgaagtccc 240
cagaatggct ggccccgcca tttctctatt ttgttttctc taacctctg ccctctctct 300
tccacctcca gtatatggca cggcacattg gaggtgtca aaaatgattt aataaatgaa 360

```

tggagaaagc acatagggcag gacatcctag taccaatgat gaatgagtgt ttatggcaga 420  
 tgtgaccag gtcctcagag gcacatgaaa aatgctaata aacggcagca ctcattattc 480  
 actgtatgaa cgtggcttca agcagtagag atgttaaagc atcctgtaat ggagtataac 540  
 tggctctctc ctctctcctt tttttttttt aatgacgccg a 581

<210> 31

<211> 648

<212> DNA

<213> Homo sapiens

<400> 31

gggagggaat gtacaaggga ttggttatat ttttagttgt gaagttgaag caggctaagg 60  
 aggggagggg gcacaccaag acggtgaggg accaggaaag aaatttgaat tggagatccc 120  
 aggacaatca gcaaattggtt ggaattgact attaaacgga tcgagctgca aagatggcat 180  
 agatattata aaatacaaaa gcccttggag acctaaaagt gagggaaaga ttgaattttg 240  
 cttttatttt tgctgacaat actttgatta ctttatgcaa acaaaagcct ttaaattttac 300  
 ttacaaaatc cattgcgttc tttgatggcg gggaattcgg ctgtcaaaaa gactccagat 360  
 cttaagttta aaaaattatt ctcttttaac cacaattcct tagttttatg ctagatcttc 420  
 ttggactaga ggtgcatttt taatagtcta ataaggatct atatcactgg catgtagatt 480  
 tttgttctgg catgttattt ttctgaggct atgttttcat ttatctggtt agtaggggaa 540  
 tcagttttct taagtctaata cataattaaa agagtatcac acaggattac tttgcttaac 600  
 tggtcaaaat ttgttcctca taaaataaga aagaaggag aaattgtc 648

<210> 32

<211> 434

<212> DNA

<213> Homo sapiens

<400> 32

ggggcctggc aggacatgat ggctactgca tggtcacagg agtttctgaa gagagtctta 60  
 actttttgca aagttgtgag caagggacag tgacgtgcc accagagggg 120  
 actgggctgc aagacagctg tggcagcctc aggaagagga tcacagccgc caggagactg 180  
 ccctggccg ggcagggtc aggagccacg gtgcacatag ctctgtgccg cagcgggccg 240

cgcagggcag gaaaggagcg tgtgtgggaa caggtgcacg tgtgggatat ccagggcggc 300  
 acagagtgag cttagtcagg tcgcactgtg ctgccgac aactgcatat aacataattc 360  
 tcttcttttg gatattgaat attaagattt ttaatagaat ttttggctaa gtaacataag 420  
 taatacagca gcaa 434

<210> 33

<211> 594

<212> DNA

<213> Homo sapiens

<400> 33  
 ggggtgcagg gatgtaagtt gggggtggtg tagaatgaag aagacggaga gaaggaagga 60  
 tctagagtgc aacagaaaag aaacaatttt ttctctcca tgcctggctg ctacctgaca 120  
 aacaatcaag aatcatagag ccgggatcct tctgtttgtc cctctaattgt atgggaaggt 180  
 ggggtgaagca tcagggttat gaatgctatc atgagacttc acacagtata tatttgtgtc 240  
 ccaaagcaga gccagacca caaggccac actgactgcc tctctgtggc aaacgtcaca 300  
 tatgtccatc acccacccta ttatttgctc ctcccttcca gaggtgaact tcctccatga 360  
 atttcccttc ctgaaactca tgatgggaac attaggctgt tgcaatacaa attggcacag 420  
 ctcaagacat tcagttttaga atgggttttc aggtgagact tcttccctat atgagagtca 480  
 cgaggctctc aaatgctgct ataaactagc aaggtggat ttgatcgtgc aattaagggt 540  
 ctagcactgc ataactatcc aggctaaaga gctcatttaa aaagggaac ttag 594

<210> 34

<211> 514

<212> DNA

<213> Homo sapiens

<400> 34  
 ggggtgatgt togagggtga atatgacaca agtccccagg gatttttggg tgcaaggggg 60  
 ccaggtgttt gggccagctg acagtgggag agtggtcagg gtgaaaactg cagggaacag 120  
 caggaagcgg caagcagaaa gggctggctg gcgttacgga aggaactgct gatcaagaac 180  
 gctgattgta ttcgtgtggg cagtgctaga aggaaagcat tggcctggct tttggaaagg 240



gtaagaagtt ggggtctcggg gagttttatg aaacacagag ttgaaatcgt gatcccagcc 300  
 attaggtgga agggtttggg gctgagaaag aaggcatagg cctgggtggtg gtttgggggg 360  
 aagtccagtg agtaagagac cctggacttt cttttcctca ctcttttccc tccaggtgtc 420  
 tctctgttgt atgctttctc ctttccgaac gtttctccct ttatttcttt ttogttctgt 480  
 cctttagttg gtcataatat ggcattggtg tata 514

<210> 35

<211> 502

<212> DNA

<213> Homo sapiens

<400> 35  
 aaaaaaaaa aaagaattct ttcacacctta gtgatgagat attaaccacc ccataacatt 60  
 ctatttttct tagtcggcat gcagaaagca ttgagaatc aggagtagca atttctgccc 120  
 attgcatgag ggggctgcga taagtaaagg gttgtgagtg tgttacaaga ggtctcctga 180  
 gacttagcac tgaagaaaac accagccaac ctaaactttt cctgaagctg atatcaggtg 240  
 aatattctct tgtgacagag gaccaggcca aaaaaaggcc aagatcataa gttttatttc 300  
 attttgggcc agtgatctca ttgctgttct aaggatgcag agggcattcc aaactcaacc 360  
 agccaactca taaacgcatg ctctttatca caggagtatg gaaggctcctg ggtcccacca 420  
 ttggtgaaaa ggacaaatag tacagccatc tgggtctaca aaaggagagt tatcctgctc 480  
 ccaattctct aaaccaatta aa 502

<210> 36

<211> 419

<212> DNA

<213> Homo sapiens

<400> 36  
 ggggatcagg tgggtggaact tttctttcct caggatatca tagtcattgc tgtctggccc 60  
 ttggccaaaa tcccctaaga taatgacatc cttttctcct ttcagggttt cctgggaggg 120  
 ctgtgctgag gctggccacc tggaacttgc agggctgttc cgtggagaag gccacaacc 180  
 ccggggtgag agagggtggtg tgcatgacac tcctggaaaa cagcatcaag cttctagctg 240  
 tgcaagaact gcttgacaga gaggccttgg aaaagggtggg aagtcacgac ctgacccttg 300

ttaaccttca cctggcagcc ctgacctcc tggggagcga ggaatcccag caagaatcac 360  
 agtgatggcc accggttggc gagctttgca caagacccta caggaaaccc tgaaaggag 419

<210> 37

<211> 698

<212> DNA

<213> Homo sapiens

<400> 37

gggtcagtag tgcattctca tgtacagaag atggcttgtg ttcccgtga gtcttcgtgt 60  
 aaattaatcc tgtgtatctt gagcatcttc caatattatc tcaaaaattc tatccattgg 120  
 aattctttca actttttggg tgctagcaga aagaggagat aaagaagcag aaagtcttgg 180  
 ctgggggtgg agttgcgggg gtttctgtcc agaggcagt ggacccggca gggcacgcac 240  
 agccctgctg tgagatttct caagcattcc catcagcatt cccaagtccg ctctctctcc 300  
 tttttaaaac agaaacaaca cacgcttctt gccggcctta taaaggacag caaaaactag 360  
 ttgcctgga aaatgtcttc tagaaaatta tctaaattta gaaaatcatc taagtctcgc 420  
 tagccttttc ccttttctag ccatttagga tagtcattgt gaccaagtaa attcagttta 480  
 ttggaaaaag aaaaaaact gccacttca gagatgatca tgctacctcc tccacagagc 540  
 tccaccagat attttggcaa acccatgtaa cacagaaaga gacagcaaaa acagggcaga 600  
 gaggagacgt aaaaggccat cagtatcttt atacttcatt tcaaaaatga aaaagtaaga 660  
 atgttaatgc tcttcagaca gcactttttt ttttttaa 698

<210> 38

<211> 431

<212> DNA

<213> Homo sapiens

<400> 38

ggggaggttc cgggatgtcc ccagagcagg tactgcagcc cctggagggc gacctctgct 60  
 atgcagacct gacctgcag ctggccggaa cctccccgcg aaaggctacc acgaagcttt 120  
 cctctgccca ggttgaccag gtggaagtgg aatatgtcac catggcttcc ttgccgaaag 180  
 aggacatttc ctatgcatct ctgaccttgg gtgctgagga tcaggaaccg acctactgca 240

acatggggcca cctcaatagc cacctccccg gcagggggccc tgaggagccc acggaataca 300  
gcaccatcag caggccttag cctgcactcc aggtctcttc ttggacccca agctgtgagc 360  
acactcctgc ctcatcgacc gtctgcccc tgctcccctt atcaggacca acccggggac 420  
tggtgcctct g 431

<210> 39

<211> 539

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 39

gtaactcaaa aaggactcta cttccacagg gctgaatcgg aactcgctcc ctctgcctct 60  
cccactctgt gttaccatct gagactctgc ccttcacggt ccaatttcaa cacaagtggc 120  
ttgattctgt gtggctcaag gattgactcc agtgcogtca accttttggc cacgaagtgc 180  
ttagtcatgt cttcagatgc atctgggtgag tctcccttcc accctgtgga agtagagtcc 240  
ttcctgggtc tcatccttcc agtagctccc gtgcctccag ggtctttgca gtcacataga 300  
gggtttgagc annnnnnnnn nnnnnnctag gctgcccggg ccttagggaa cgaagaccaa 360  
actcggcagt gtggaccaga gcacacgcca ggcgaccaca cgcttcccac cccgccgccg 420  
ttcccactcc cttcatgctt cttgcagtc tcacgtcaca cctttgctct ggaacattct 480  
tcttctaca aagcctggcc atgggcggcc tcgccatgaa gccaggccct tgttcttcc 539

<210> 40

<211> 659

<212> DNA

<213> Homo sapiens

&lt;400&gt; 40

```

gcgggaaatg gccccagatt ctagtccct aactacattg caagctctcc tggggtcaca    60
gactgttcct tctattccac actcttaaag aatgcatcta gttctgtggc ttgcaaactt    120
ttactttcat ttatgtatgt ttatttgtaa gttttatata aataagcaaa actaaatgtt    180
agagacactg gctaacgtta gtttgatat cattagttta ttataaaaga gagacatgga    240
aattattttac acaatgaaag atttcagaac tccagtggaa tcagtgtctt cacatgaggg    300
tttttcaata gtgattttatt tcggtatata tactttccaa gaatgccacc atttctaaat    360
aagaaattat cctgtgtgtc cagaactact ttggtgcctc catattctag attctggggg    420
aagaattttta tctccagctt ttgggctaac tggttgaatc tctccaccct ttcctttaga    480
gcccaataca acagcttcta cagttgcttg caatactttt gagatttttc tggagacata    540
atgcctcctt tggttacagt ctacagctgca ttcctttcaa ctaataccca gtcaaagagg    600
cgaaaaaaac tttctaaatg actcggggca ccacagctta tactctccct ttcaaactg    659

```

&lt;210&gt; 41

&lt;211&gt; 647

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 41

```

tgaaaggcct tcttaggtac aaagaactca agaaacactt tggaaccaa ccaatttctc    60
tgagaaccct ttcaaaaaga gctagagctc catctataat cagcaaagta tctgtcaacg    120
aaagccaagg atcaatgtac agtgactacc agaacagggtt agaagggcac actcataaac    180
ctttgctact ggtttggggg tttcagtttt aacttttctg ttaaaattct cagcatttat    240
ctcaaagtaa agtattttt aaaatgaaat aatgaaggag gtttattaga tgggaagggg    300
taactgatta agacaaagta taaggatctt ttcaaaatcc atctctaaac atcaataaac    360
tgcttcagaa aatctctcac taggaattat acacacaccc atttgatata atatggataa    420
gtcttcacca ccagtctaaa tccctcttcc cacctcccat ccaacatacg ttaacatgga    480
gatggttaag caagctgccc atagctcttc tttgaatttt ccctatagcc ccattaccct    540
ttttttaaac agaaaaactg atttagatag aaagaacaag ttttgttttt gcaaagctta    600
tgatagactt acaaattcaa tgacaaaaat cagtaatatt taaaatg                    647

```

&lt;210&gt; 42

&lt;211&gt; 715

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 42

```

gggacttggg gtctgctaag gtaaataagca ctgcattaat ggtcttatcg atttaagggg      60
atctccctct ttctcaacc tgggccagcg agaggagtc cccagtggag ggcattgtctc      120
actgctcaag agaggtttgt atccttgctg ctccagcaact ggggctagga taccctgaaa      180
attctggaaa tcaccaagcc acatcagtgg catgactgga agctcatgac tgtctgatgc      240
tgtagaggaa gttccctga tgtccagac ccagggacg gatgcagagc aggggagggg      300
acccttccc ctggttgac accatcttcc agaccctgg gattcagggg acaaatgcag      360
atcaaaaagt agggcaaaaa cagttctgtg cctccctttt aaggttcaac tcgggactga      420
aaaatcttgc gtttccttac accagccgca ctcaattgcg tgtgaagatg ctctcctct      480
cttcgttctt gttgatttcc tgacttaact tactgagaat cctgcaagat aaagagacag      540
atgaagagat aaaaccatca ctcaagtctca accttcccc tgacccttga tatcccttg      600
tctatagaaa cttggggcac cagggccaac tttggccagg ctctcttttg tcacctctgc      660
agggaccctc tgctcttcac ttctcccag aacttgccat cttattcccc gggcc      715

```

&lt;210&gt; 43

&lt;211&gt; 619

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 43

```

ggggaagaaa aaaagatgag ttgttcatgg ctagtgtcct tcagaaatgc ccagtgtgga      60
ggagaacaga ccagaacctg gtgggcattg ggccagagag acatgaagat acataggagc      120
tctgaggggac cccagccca cccagcccta gagcaggggag aacaggggtg gtttaaggcac      180
aagtttgttc ttaggctgtg ttcaagaaca actagaattg tttgggtaaa gtaggaggaa      240
gatgttctctg ttacaagag gggacagctt gtgaagacca ggaggtgggg ttgatcatgg      300
ccaactctga gaacctcaag aagttcagtc ctactgggca gtccagtgga agaggggagt      360
ggcataagag agctgtagag agggcaggga ccagtccttt cagggtctcg atgctaggct      420

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gggaagcttg gtttatcctg agggcaatgg gaaccatggt aggatttaag caggggtgga 480  
 cctggggaga ggcccagagg tgtgttttag aaagctgact tatgctggct gatgtgcaga 540  
 ggcagtgggt cggtgaggag gctgggccag tagtccaggc aggtggccag ggcagtgggg 600  
 atggaggagg agtgatata 619

<210> 44

<211> 760

<212> DNA

<213> Homo sapiens

<400> 44  
 gggatacatc ataatacttt ttattagcat agcctttgtc aatctagcct cctcaagggt 60  
 ctttaggacc tggcttctgc agttgaaaag aacagtgtct tcctccaag ggcagctgt 120  
 ctttttcatt gaacttggtg ctagaggagc ttctagtttt aaagcacata ctcttttagcg 180  
 tatgtgttaa tttcattaac caccagtaag ttcttcttat gcatgggcca aaataatgat 240  
 atatcccgct tgtggccaag gtgagaacca tagataggct tgttatttta cttttctttc 300  
 ttacctgcag gctctcaaag atattttttc tccttaagtt tgagcatatt tcatgtaaat 360  
 aaaagggatc ccaaagagca tcttgtgoga acccttggct caagacaacc caacctaaaa 420  
 ttcatctaga tcacctggac ttttatgttg aaaggatttt tccccagaa taggacattt 480  
 gtttcccatc tattctggct tacaatactg aagagtccca gtccatattt atgaaggaag 540  
 cagccttaaa gtgttaccat gaacacttta taaacaggca ttgtgggcct ttgaaaagaa 600  
 agctgctgat gtctgagttt tatgggagtc ctagccagggt gttaagtgt tcttcttaac 660  
 acttaagtat attttgtaac agaagaaaaa tgaaaattag tatactctgcg cttcataatt 720  
 atcatattaa agagttgagt cgatttttagc aactaaacta 760

<210> 45

<211> 675

<212> DNA

<213> Homo sapiens

<400> 45  
 ggggtaggag aagggggagg agggatgctt aaaaaaaaaa aaacctgctg gagtgcaga 60  
 taacttgaga gaacttcctt acaggggaaa aaacttctaa agaatgatgg ccaaattact 120

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ttggctgtgt tcagggttaga cactttttga tgcctatcac ttcataattt tagcagcaat   180
caaaccaaac acttcattaa atataaaatg ttctcaaaag gcagttagt gttttaattt   240
ccaaacacac ttatttagaa atccoctctc agggctgtca atgaaatgct gagggaaaaa   300
cacatcacac acagggactt tgtgagtctc agaagccata acacacctca tggaacaaat   360
gacaaatata tgattggtac tgcaggttcc agttaagagg aagcactgaa gacgaactag   420
tcaggaaata tgcattgtta gaatttcaag atgttacct gccaaataaa ggaaatcaac   480
tgaccttcac tattcttctc agtctctgaa gatggaacta ctcaggtctg gtttcagata   540
tgggctaaaa caaagagatc cagttgccaa gtttgaaata tctgagggct cagcctcgaa   600
aaacttcatt ttaaatgaga caaagatatg taaagcactt ggtatttcac ccaccacgca   660
atacatgttt aatga                                     675

```

&lt;210&gt; 46

&lt;211&gt; 540

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

```

<400> 46
ggggtgctcg gagaaggcag acatgggaaa accctactaa aatcctgagc tcctcgtgct   60
gtgccgcctt cccaaccat ttccctgcc caagggcaag tccaagaga gagcagagga   120
gagtttgtaa gagaagctgc cccaggaga gaaggaaggt gcaagtgtac aagtaaacac   180
ggtagcaata acccactgaa tgccgctctg ctgggctcaa ggctgaacga catctggaca   240
ctgctggaca tctgcagctc tggtaacaa acacactgca tccagccag agggccctcc   300
tgcatagaca gtgcctaacc ctggggcttc tcagctaagg gagagggaag cgggcctcac   360
tccaaacaag ggtcaccctt tgccggcctc acatctaaag ggaccaccac agtcaagctg   420
aggaacttcc tcagcaggcc cctcaccacc ccaccagcc caggtcaacc gccaggagac   480
tgctgagggc tagacagcta ccaggggaga gacagaagcc acaggatgcc atgggggggt   540

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&lt;210&gt; 47

&lt;211&gt; 405

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

<400> 47  
 ggggtagatg gcactctcat catgaaagcc aggtcggctg gtgatgatct ataaaaaaca 60  
 ttcccccaac ctgggattga ggtcactgaa gaatttagaa gtccagtttc ctgtgttccc 120  
 catcggacta ggggggtctaa cagtatatag cctgggggag gtgagtgaga ccagcgatat 180  
 atagagagga gaatcaggga aatacgggaa tgggggttgag ccttccctcc ctgttcccat 240  
 taacagcagc ctcttgctga tccataccaa cccagcgta tctccagccc ctgcaaaacc 300  
 aggtcagtggt tgtctgctac acagcctact ctctgtcttt gggtgatttg tctctctttg 360  
 cagcccaaaa gtgggtttta aggctaccac aggaaactgg acttc 405

<210> 48

<211> 527

<212> DNA

<213> Homo sapiens

<400> 48  
 ggggcacctt ggcgaggtgg cgctgccgga ggctgagggc tatctacacc atcatgcgct 60  
 ggttccggag acacaagggtg cgggctcacc tggctgagct gcagcggcga ttccaggctg 120  
 caaggcagcc gccactctac gggcgtgacc ttgtgtggcc gctgccccct gctgtgctgc 180  
 agcccttcca ggacacctgc cacgcactct tctgcaggtg gcgggcccgg cagctgggtga 240  
 agaacatccc cccttcagac atgccccaga tcaaggccaa ggtggccgcc atgggggcc 300  
 tgcaagggct tcgtcaggac tggggctgcc gacgggcctg ggcccagagac tacctgtcct 360  
 ctgccactga caatcccaca gcatcaagcc tgtttgtctca gcgactaaag acacttcggg 420  
 acaaagatgg cttcggggct gtgctctttt caagccatgt ccgcaagggtg aaccgccaat 480  
 tgtccgcccc gccagcgctg caaataaacc ttctgagtea gccctct 527

<210> 49

<211> 533

<212> DNA

<213> Homo sapiens

<400> 49  
 ggggtggctgg tttctgaggg acgtctgaat atttccacca taaatccatt tctaggtctg 60



ataaggcagc caccaaaaca aaaaacaaaa agcacctgca ctccctctt gctgttgatg	120
caagcctgct gctagctctc cacatcaccg gtgagggaaat cctagcttca ggcctctaac	180
cctgactagt gactcatctg ggagtaaagg ggtcacatat ttctatctgt gtgcctacaa	240
actagagatc agcaaggctc gcaaagtttt agccccagga agaataaaaa ccggaagcag	300
tcatgttctt tctctcctct ctgccaaagt cctgaaggag agaggggtgcc ttctgctcac	360
ctcaactttt cttacctatc acattacttt gtgctccatt ttctacggct aggcatttgc	420
taaagtatga gcaaatgaac attttattag tattttatct gtatttttgg agaagatata	480
gagtttcatg agaaacactg atttttctca aacaatagaa aaagtgtttt ttg	533

&lt;210&gt; 50

&lt;211&gt; 439

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 50

gggccacaat ggcagctttg gggaccacaa ttcgggaaca tgtattctca aagtcagcat	60
ggatgtcaat acccctgatt taatggcacc tgtgtctgct aaaaaagaaa agaaagtctc	120
ctgcatgttc attcctgatg ggcgggtgtc tgtctctgct cgaattgaca gaaaaggatt	180
ctgtgaagggt aaaatcctaa cgcttatggc agttaaaaca ggaactggat tcacgggcga	240
tggacattat actgagattc attacagtta acttacctat actaatttat gctattgatg	300
taataatatc gtgcagtagt ttcacttcat cgtgatgaat aaatgcccat ctatctctct	360
ttgtagactt gcctaacgat atctcacctc tactcccatg aattcacctt tgattccatt	420
gtgaactgtc aatcataag	439

&lt;210&gt; 51

&lt;211&gt; 666

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 51

gggggcggcg gcaccaagc ctgcagtga gcaagtgatg acaggagcac gggaggagct	60
gcctgtagtg cccatttcta ttctggaatg aacagagaaa ccctctgccc aaataagctt	120
tgaatataag tgaactggct tgtattagaa ttactgggtt aactggcttg tattagaatt	180

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tacacaaagt ggctttgaaa atcgagccgt ctcttagtag tggtatccca aggcattcaa    240
tagttctgag gtttttcata tatgagtgat tatcccaatg tgctaaagaa aaagagaaag    300
agaatatata agatttgaac aaagcaaata tgttacgaaa ttttaaattc tgttcactaa    360
gtcaaaaata tgcttctcgc taatacatat tcataaacat ttgcttattt tgcataaaac    420
agaatctaaa gtagcaaaaa catcacagag aaagactggg acacacaggg atcacagaaa    480
acacagtcoo caatcacaca ggaacacagg aacacagatt cggttttaaa tcttatcttt    540
caacttaaaa aaaagactca aatctctctt aagttctaata tataaaacaa atttctatat    600
ttatattata tgtatgaact agaaataata attgtacgat tattcacgtt tctattatat    660
ttgagt                                           666

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<210> 52

<211> 592

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 52

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ggggcggtag cggtagtggc tgcttcacga gcagggcctg ggccagctgg cgctgggtgct    60
gctggatctg ctgctgcaga ttagtgattg tgcgcgcaac ctggcaggca gagacatagg    120
tgcggttaact aggtgggaag ggacactcat ggcttgtcta gggaccaaata gcattcttca    180
ttgtctttat gctgaggcca ctactggcta ggccaacctc ctcccaaacc tagctgaacc    240
caggaatttt caaaggaagg cttggctaga gaaaaatcaa tgatcatcta atagttcatc    300
aattagcgtc tcttctatca gggaaaatta tagctcatga caaaaatcaa tctgggtagc    360
acctacttgc tgctctgtgt gtctcatgga tccggacnnn nnnnnnnnnn nnnntaacat    420
ctgctgctgg atttgtaaac gttggtatgc ctgttgacag aacgaagagt taaaatagta    480

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tgataattaa gtgtaagttg aactaatggt tcaactttct gacattagtt aaaaaataaa 540

aaaagagaac ctagccactc ttcttggtcc atactgtggc tgacacatac tg 592

<210> 53

<211> 498

<212> DNA

<213> Homo sapiens

<400> 53

gggggtgaag agtgaaattg gactgttaga ctocatgata gtcaaaggac ataacatcct .60

atcttactgt ccttcagaag agctaaaatg ttctcagaga gtgacaaaaa gatgatagtt 120

acttccttga cagcaacata gggagaaact ttatgaaaag ctagaaaatt tatatgcac 180

tgacttcagt gactatccaa aataaatttc aaagtataca attttttttt tacaagacag 240

ctcaagtagc accaccattt ccctttaaaa aaaaataaaa taagcctttt ccctgattgt 300

aaggattatg cacaatattc tagataaaaa ttttggaag cataagagac gaaaattacc 360

tatagtctca caagttaata ttgtggttta catttcagtg catatacttc tgggtcttttt 420

ttctctttgt agactttcta cgaaatttca tatttttccc agaagtcagg ctgctagatc 480

tgtgtgatct ttaccgaa 498

<210> 54

<211> 464

<212> DNA

<213> Homo sapiens

<400> 54

gggaacagtg tgtaggaagt tggaacagaa tgtgaaaagg acacagagga accaaaaagc 60

acccttaca ggtggggccc agagtgcag gagatacagc aggcagggcc agatcaggca 120

gagccttggtg gttcccatgc agggacctgt ctggattctt agagcaaccg gcagcccctg 180

gagggtttta agcaggcaag ggcatactca gggctgagcg tttgaataac ctctctggct 240

acaatgcttt tattggccac aatatttttg aagactgaag ttaacacatg gtctgagcag 300

cttactcttg cccccctgaa gaattctagg aactgtgtga ggctgcagtg gtcagagggg 360

ctgctgagcc atgagaagaa aagggacact ggagctgcgc agcaaaaggg ctctgaggtc 420

gccagagtgg ctgccagata aggaacagtg ggaggagcg gctg 464

&lt;210&gt; 55

&lt;211&gt; 682

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 55

```

gggggggactg ggtgttttgg ctcaaataat aaaaagcgg cttgtgatca agtgtgccag      60
tcttcgtttt gcttcccaact ggagtgcca caactgctga ggacaactca ggcccatgag      120
gtttgctcaa atggagactt ttaacagtgg aaaacgcaga cactgtctgg actggaagtg      180
taattcagac tgtatttcaa gacgtcacat cttcagggat caagaaaaaa caatcactoc      240
ttatttgaac acaattaggt aggtgtgttc tatcatcctg gccacatttt tataaacaaa      300
tatactgcaa atttgaaaac agtgaggacg tcaggagtta aagtgtata atatgtaact      360
aaactagaag gaactaaatt acaaatttac tcctgggagg cttttatatt cctctcaagt      420
ttcaagcaat aaacatctat catttaacaa accagctggg catatctgcc ctcttttacc      480
aagtctttaa cctgtctcaa cacgaacagc taaggacaaa aggcagagat cctttatcca      540
ggttaaatcc actctgggaa agtgtaaaa ctttccaccg gtaattttac ctttaaatca      600
tcatgttgta gatacttttt tctgtaagggt gtttttatat tcaatacctt cacagtatga      660
atgagattct aagatcagta at                                     682

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&lt;210&gt; 56

&lt;211&gt; 633

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 56

```

gggttgccaa atgacagact ctccagtcac gaaaaggaat ataaagcaat ctcaactacaa      60
aaaaaaaaat tcttgtaaaa atcctccctt cttcagatgt tgtaattaat tatgccaaaa      120
caaacctctg gatttctatc caagcctaaa tccagttta ttttatttct tagaaatgat      180
aaatactttt tgacaatttg ttttgctaca tccaagtctt ttagtggttg gctttgttat      240
caaattcacc attttaaatg attttaacaa ggttgccaaa gaacatacgg ggaaaaaaaa      300
cttttcata tatccttggc agaaactggc attccccctt tctcagttcc cttctgagag      360

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tgctgtctgt cgctggagca gctatagcag tgtgtttacc cagttgatag tgcacacatc	420
cttctcactg caggacacca ggcaccttc cttggcctct ggcaccttct gccaggttac	480
tgccagcct cctctattac ccacgcccct ctttttctgt gcaaccccca actgggcctc	540
cttttctctc atcagctaag ctacttttaa acatttgggt ctcaggcccc taacaaaagc	600
aaatttgccc atctgattta tttcaaaagg gag	633

&lt;210&gt; 57

&lt;211&gt; 734

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 57

ggggaaaaaa gatttagaat tgaaaagaac ttggattggg aaaattaaaa ctaaaatcaa	60
cagtttctag tttctaagag accaaaagtt actatgaagt aaagctaggc ttttcatttt	120
catgaaataa tttacaatga caacagaaac aaaacataag tgaacacaat taaggctgtt	180
tgtacctcaa atgtggagtt ttttagtgga taccaagttt tggtagcac aagggggtaa	240
cattctaatt caattattat ttttttaaat cagtaaatag ctgccctcaa ctggataata	300
cagggcattg caactgtggc aaaccaaacg ctgtaacaga atcctgtgtt tgcataata	360
tatttttgga aaaagaagac attatcaatg attgggcaaa gtgagtacta atttccaaat	420
atatatacta caagtttcat ttttttgga ggattcaagt aacagtattt ctaatgcat	480
attccaatc aacacgaaac actaaaaaaaa caaaccttca aatgtagaca aaaaccctaa	540
taaatgaggg aatcataga caaggtatat aagaacccca actgttaata cttcaaaatg	600
tagctaattc catgtgttca agaaaagata aagtctgagt ctcaattcta ctcttaaaaa	660
cattaaagat actctttaat tactacccaa attgagactc ttaaaaacag acaagctctt	720
ttaaagatga tacc	734

&lt;210&gt; 58

&lt;211&gt; 418

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 58

ctttagcctg tggctgtgtg tcaaggttag gacagctatt gatgtgtgca tgcgtgcctg	60
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tatagggcac caggggaaggt agcaagtaaa aatttagatc atagcaaaga gagaatataa	120
ttcagactct gtctctagct cttgaatagc acctgctcct ctttgtccct cctcatgtcc	180
catacaattc acttctaaag atacagatct tactgaacaa gttttccaag tagggcttca	240
aaataaggtc tcttacagga aaataatgcc taaaactctg tagataccat tggaagactt	300
caaaactcaac tgtccttcca catggccaaa caaaaataat ataataaaag caaataaaaa	360
ataagaacca gacaggggcc atgtatttgc tatttcatat acattatgcc aagtaagc	418

&lt;210&gt; 59

&lt;211&gt; 593

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

<400> 59	
gggattatct gatacaattc cttgggaatt ttcaattgcc caattttact actttggtgg	60
taaaatattt tgttaatggg ttgtaaaaata tccatccact ttgctggata catctacaaa	120
cataaccacc tcagctagta acagtaccgt acatggaaaa gggaggaatc tgtacaaacc	180
tcttttatgg caccatcaca gagtagtagc catttattgg gctcctaatt tcaggaatcc	240
tcagccactt ctattcctgc taccgtatct tttcattaga ttgtgcctcc ttacataggt	300
gctagtcaag cccaagtctg ttacacctaa tcaagcccaa gtttggtata cctctttgag	360
tactattcag aagactacag gctgccactg ccaacttcag gtaaaaaccc gacaactagg	420
ccagttgtcc aagctccatc ccttgctacc aaggccctaa tttgccttaa ggtgaagatg	480
attcaaatta tgacagtctg ccttgccgtc ttcattagag tataagctcc ttgaatgcc	540
caaccattgg tttcactggg aggtggttct cttatcacc ccaaaatact gca	593

&lt;210&gt; 60

&lt;211&gt; 689

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

<400> 60	
ggggaactta aggaattaat tgtatttgtc caaaccaaac acatcttttag gtttgctgac	60
tcaatcataa taatgggttt agttccatct tatgaggttg atttgtttct gataacctgt	120

ataaaagatt gaccttgcca gtttgactt atttgaatac aaactacttt tcaataactt	180
tccccaagac ttgaggtaaa gttcagggat gttataagta aaaatatctt taacctttta	240
aaggcagatg ccacacaaaa ccttgcaaag gaaaacaagg gagccacaca tatcaatgga	300
gacctttaag tctgtggttc tatttctagc atttatcgtg aagaatcatt aaagaggtaa	360
gcaaagatga atgcataaat ttattcagtg gtgtactgtt tctaattgtga ataactggaa	420
atcagtgtag ctcaatacag actgagttaa attacgtgt atccttaca tggaatgtta	480
tgcatcatt agaaatgtaa tgcaagaata tttaatgaca tgaaaagttg ttcattgat	540
tttttaata aaaaagcagg ttatgataca atatataagc atacttccag tttttagtaa	600
gtatgtatgt atgtgtgtat ctgaaaaaat atcaatcaag ctgttaaaat gattaataag	660
tcaaagaatt agagataatt ttgattttt	689

&lt;210&gt; 61

&lt;211&gt; 609

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 61

cttaaaaaat aaaaaataat gatacaaatg atatgaaatg cttgaatgca gaaaatacag	60
aatattttcaa taaagggtcaa gaacattaaa gtaataaatt tccttgacat cttatgaacc	120
actgattata gaattaaatt tagtgtttgc tttaaaacaa cataatttct gatttgaaag	180
cataggaaac tcagaggaat ttacaagcaa aaagctatctt aaaagctgcc ctctctatctt	240
gatgaaagat aaagaagtac aagctcatctt acttgacaaa ggcagtgtgg cagataatcc	300
aaaacaaaaa tgtactgagc atacaatata ttatgccaat ttgcagtaga cttaaccttt	360
cttgaaactc ttagcctaga acagaattaa tattaatttt gcatgtgatt aactagagag	420
agcttgagcc cgaagcatga taggttataa aggaaaattt cacatgtgag ttgctgagtc	480
cttgctgaat ttcaatagct taaaaatctt ttatttgctc tgagctactt gtgagagctt	540
gtagtttaat aaaagttgtc tttaaaatta catggatggg tatgaaacca attttgctca	600
ttttttggg	609

&lt;210&gt; 62

&lt;211&gt; 665

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 62

```

gggtccgggt cagcttccca aatttgcatt tctaacaaag tetcaggtcg tcctgggato   60
tcacactaag aacctctgtt ctagtctgaa ggctgaacta ggaagctgtc aataccgcta   120
acacacacaa aaaactcatc atcattcccc cagggtgttca tttgtcctcc atctctgaat   180
aagtcttcca ttttacttgg gtactatgct aaggaactgg cttactttca acttcttttt   240
tgggggggtct tattccaatg ttagggaatc tcttttgaaa tccacaacat tctccaacac   300
tgaaagcaag gaggtagttt taattacatt ttatagatac atgaaaagtt tacaagggta   360
aagacttcca gatatttttg gaacaactct ttttctactt gataattcct aaaagctatt   420
aacacatgct gttataaaaag agaagattta gagcctctgt ttactgctgc cttgtcactt   480
actgccaggg ttctcccaca cacacaaaaa aaacaactaa aaattaaact aagagtgaac   540
ccctgtgtac acaatataac gccacaaaat catttcattt ctgttgcttt aatgtatttt   600
caaagaaaag attaaaagca agaatcatc taacaacatt tctagatata ggcataatgt   660
cattt                                           665

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&lt;210&gt; 63

&lt;211&gt; 534

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 63

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gggggggcaaa acagacaagg tccaaggaga aataagaaaa aaacaaaagc aagaaggaaa   60
tagatgtgct tacttacagg gacagctagt aggtctggaat ggcgagaagt atatgaaagg   120
aaggtagaaa aaataaagct gaaaaggtag attgggacca agattcatgc ttctattcaa   180
actgcactta ttgaagctta ctaaattgaa gcactctgtg ctaaggtagt gaagagaaag   240
agatacaaaa acttcaatga ggcacaatcc cttcccttac aagggaatca cgcacagcac   300
atccttggtg cacggtaa atcagcaaatgt ctctaataaa tccagtcaaa tgaaaaaggc   360
aaaagtgttg aagtaggaag gcctaagaga aactaaagag taactaccat ctgatgatag   420
acctaagcc ctataactcc cttcctctac atgtatacac acacccaca tagcacacaa   480
cttgtaatt cctatgtaag aatatgaata taacatgtgc agggacgaaa gaaa           534

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&lt;210&gt; 64

&lt;211&gt; 659

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 64

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tccaccgggg tggcgccgc gggcacaag gcatgaaagt cttggcatgt tgaaggaagc      60
cagctttttc ttaacctcat taaatcatc tgaccaaaa atatatacct tatttcctcc      120
tttctaagtt aagaggaaaa aaatcagtaa agagcttgag tatttggaga agaaatgtca      180
ctgaggtcac tccatggaca tgatttggac cctgacatc attttaacag gggggttcgg      240
ggatttccat atactggctt tacatcactt gcctgcctgc caaacaaccc ccctacttta      300
acaagcacca ggtgctcatc cttctatcac agacatgcag cccctgagct tccagagtag      360
ctgtccctgc cagctgctag caggaagtc agaagcatag aaatgaagaa gcagccaaag      420
ctctgcccac gatacaattt caaagcagct catctttctt aggagacctg ccaaataagg      480
tggccctgac ccattaaaga gacaggcaga cccattaact ctatggttca cttgtcctgc      540
tgtccagact gcactcagcc tgctttcctg tcaatccaca tatgtgctat ctacagagag      600
gggactaaca tttatcaagc agctattggt ttatgttatc ttactatacc tattttttg      659

```

&lt;210&gt; 65

&lt;211&gt; 653

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 65

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gggatgtgta aatggcttta atgaccatat tttatctgtc agttccactt tttgagaatt      60
tgacataatc acctaagctt ctgtgtaaag agactcccaa tgggtattata ttaaactaac      120
aaaaaaatta gaagccacct aaatatacaa caatggggga ttagttacat tattctgtaa      180
gtatgtggcc aagaaaggtg cagcaattaa tcatgcttct gaagactagg gatgcataaa      240
aatgctcaca gagtagtaag cagaaaacaa tatatcttct atgcttgtca ttttatataa      300
gatttgtgac acgtatgtaa aatggagatt aaaaggaaaa cactgttaat gagttagtgc      360
tctgtgggta ctggcaactt taaattattc tacactatct tcagaattga acacatatta      420
taattgaaga gaaaaacaag aaacattttt attttttatt ttttgggtga cagagcaaaa      480

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ccttgtctct aaataaataa agtgcataag taattattat gttgttagag tataaataaa 540  
 tcggtgtaac ggttctagaa agcaacctag ggatgtgtaa atggctttaa tgaccatatt 600  
 ttatctgtca gttccacttt ttgagaattt gacataatca cctaagcttc tgt 653

<210> 66

<211> 567

<212> DNA

<213> Homo sapiens

<400> 66  
 atttttcttt taaataacat ttgtttacaa gctaattgtc agaactcagt ttactgagc 60  
 gttcccatatc tggcaacttt tcatgcttat aaattggcta ttggggttga cagaatatat 120  
 tagctagcta attgttttct tttaaaaatc aaaatacttg tgaacaaatt acttagcaag 180  
 cagcaaaaaa ctttttagaa tagaatcaaa agcttcacct tccaccataa atccagttct 240  
 tttatcttgc attcttcata ttaatcatta aaactgttga actaaaactc tgaaaagaaa 300  
 ttaaaatttt tttcctaaga taggctacta gagctagaat agattatttt ctgtggctgt 360  
 agtaactcag gacaatgata gatgagggt gaattacagg gaaaaggatc aatactctta 420  
 tttttctctc cttttcatcc caaaaactag gcgtcagagc atatatgatg aattccactg 480  
 gggcaaagca ttctggaagc taaaattaga ggtgggaact ccctgttttg tgtgaataac 540  
 aggaagtgga attgaaatgt aatgcc 567

<210> 67

<211> 647

<212> DNA

<213> Homo sapiens

<400> 67  
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 cggtgcttta gggatgtcat aaatattggg cttggtgttc tgetgttcca ctcggggaat 120  
 cagaaagctt gaaggaacct ttagctgac atcttcaccc aaaggaaatg tgcctctggg 180  
 tacaagaaag ccataagaag gaatttctgg aaggctgagt tttttctgca tgggcacatt 240  
 gttattcagt tgtggagtga gggacctgga tctgccactt ggaggattgt agaaagtgga 300  
 gctggaactg gggagagcgt ggggccttga ttcttccgca aagctggtga gaggcgtgtt 360

tctgacgctg gcctttcctg gagacactgg agtgtcataa atccattccg atttctgagg 420  
 atttggtaat gtgctgtaac cgctcttct taaggtagtc actgatata ggggaacacc 480  
 ctgcccctgt gggagaacca cacatagttg ccgggttagt agctttccaa agagggcgcg 540  
 agtgcgttgt ttaaattctca tcgtcactcc gccgtcctt cagtggctcc ccatttctgt 600  
 taccactcaa ggtccttcag gattcttttg agcctcattt ctttcga 647

<210> 68

<211> 613

<212> DNA

<213> Homo sapiens

<400> 68

aaatgtgccacatata gcaaggtttg tcagtactga ttaatatattt tacattctaa 60  
 tattctttgt tagaattgta tttattttat gaagcccctt ttgaatctac agcagactac 120  
 ctgggaagta gttatagagg tcatcatcgt gtcttggtga ttcactttgg gaaattttgt 180  
 tgagtgaggc tggatgaacct agaaagctgc ttcttctgcc tcccatttc tgtcccaag 240  
 gccctgctgt ggttcaaaag cccatataaa cctgcagttt cctttcttc cagataggg 300  
 cgcgcaccta cactgttagg gtatggggcc gactggctcc tgccctgtgg gaggtttgat 360  
 ccttgccat ttagaggccc ttccttattc atggacactc tactgagtgt ctgttgcaaa 420  
 ctccctggta taaacccag acgtcatgga tttaccacac taattattag agtggccatt 480  
 atttgcaata aaatagtgac ccttgccact gtgttttcct accaaataaa cttactgaca 540  
 agtatctgca ttggtgggt cgagggtgca tcaaatacgc ctaggtttgg atgtgctgtt 600  
 ttgctagctg tag 613

<210> 69

<211> 635

<212> DNA

<213> Homo sapiens

<400> 69

ggggggaaaa ctgaaacaaa gttggaaatt atttggttaa ggatataatag cagaagaaag 60  
 aatttaagt agcctaagtc acactttgac catgaattat gctctacatc ttttaagttt 120

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attcagatca ttagttttat cattaagaga catttgtaa gtatatctt tattcaaagc 180
ttaaattccat tttctaatta aattagacaa cactttcttt acaagaaaat tgaataatct 240
gatagtagct ttcattagaa tcaaatgtta gccttttatt ttgtttttgt tttttaagca 300
ttggcagctg tttgtgaagt cataagaaag cgagtaaaga ggtaatttat taattagatt 360
gaaatattaa atctattcct tttttcccaa gatactagtt ttcccagaag gtacttgtac 420
taatcgttcc tgtttgatta cttttaaac aggtgagaaa aattaaatta tgtattctaa 480
caaagtaata tgtgagattt tgcaaatgat tttatagaaa tacacaaaat aactctttag 540
cttgctctga gcattttttt cttttctgat agcaactttt taacgttggtg gatccacaga 600
acttactgct ttgctttctc ttttggggtc ataat 635

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<210> 70

<211> 623

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 70

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gggggatttg ctgatggatg gatgtgggct atgagagaca ggagtccagg ctgactccca 60
aggtagaga actagcactt aagtgtcata catttctgcc tgacttgagg gtcttttatt 120
tttactaaa tgattttaga gtctcaagta aaaattcaaa agacatagaa aattttgccc 180
caaaacttat ttaatcaaag gatatatatg aacacttgag atagtatcac cttgctgcta 240
gatctttata ctttttgaa atgcctttgc caaagtgaac acttagttaa tcatctatac 300
atgtctctgt gtgccattt atttggcctc aaattgaccg gactattatt tagagtaaga 360
ggatgacnnn nnnnnnnnnn nnnnnnnnnn nnnctcttg acctaaactgt atgaccaaac 420
ctttaaagt gtggttactg ggaaagcacc aactctgact gtacatccta cttcagaagg 480
gcaaagaatt acctatctaa acttcttga atttcccacg actctcgtag ttgcacagta 540

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tttgacagct tggaaagcac tgttttacaa aaagtgtttt ataatccttt agctttcctt 600  
 taaaggtagg taagattggt ttc 623

<210> 71

<211> 573

<212> DNA

<213> Homo sapiens

<400> 71

gagaaagaga atgaatgttt ataaactaca ctcaccaca atttcataaa aatcgtttga 60  
 ttgctgatgc ttccttaaaa gacttaaagc agggtttgt gaggcagatg atgttacaga 120  
 gcaataattg gacaagttcg aattacttct ggacaagaaa caaagccact actacaacat 180  
 aagagaacag ataatcagct gaacaatcta ataccctct ccccaaagcc ttccatataa 240  
 aactctgttt tcatcattta gaaattaaaa taaccctacc atattgtctg ggctttctta 300  
 gctttctcca tcaaattaac ttcctaactc caaatttagc ttttcttaag gcttaaaaaa 360  
 ccatcttctt ccactttctc cttcataaca aggaggctgt cacggaaaac acccaaataa 420  
 atttcacca tgtccctaag taagagtctt ggagacacag ttaaggccat ctctggagtt 480  
 ccaggttgtc tgtgaggtag acctggtatc tgaattcaag taaagacctg gaataacctca 540  
 tcgcctgaat tctgaacagc agattcatgc tgg 573

<210> 72

<211> 630

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 72  
 gggggacagg cgacgtgggg agtgtctgtg gtcacaactg ggggccccag cacttagagc 60  
 ctgtgactca gtatgtacac gtagcaccaa atgctttttg gttctgtctt gggcatctcc 120  
 gcacgggcac ttccgccagt ggtttcttcc attgcctttg ggatgagcag gcctcctgaa 180  
 agcaggcctg atattctctg gtcttctgac aaagaatggg aaatttctca caccgtcnnn 240  
 nnnnnnnnnn nncctgggga tgggatttga agggcttggg ttgccgaatt gctcctagaa 300  
 ccacaggctt agaggagttt tctatgaaca gcggtcctgg caggacaga ctgaggatcg 360  
 gtagggctga atgaagacaa tccacctcc ttcaagagcc acctcaactt atgttttttt 420  
 cccacaaagc ccccccccg attttgccag ccttttactg atcacatcat ccactttctc 480  
 acagacctta caatttagca ttggcttata tattgcctta tattgaataa tgttttatgg 540  
 tcttgttttt cctaccactt ccttatgtgt agagactgtg atccatattt cctcttgatc 600  
 cctgtaaaga tgctgagcac acagtagggg 630

<210> 73

<211> 625

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 73  
 ggggtcagaa tgctggagct caagctttgg gccttgatgc atataataac tcataaaatg 60  
 taatattcag gaaggaatga ggctcctaaa gaagtgagaa agtagaatga acaaaggcct 120  
 aagagaatag aaatgtattc taacnnnnnn nnnnnnnnnn nnnnnngtaa gagtgccag 180  
 gggattgag attgttagat tattttataa tgatataact taagggatc caaaataatg 240  
 aacataaaat gttattatta gatttttttc cttttcacat acttgaagga caaattatat 300

catattgtct ttttttcttc cccaatacta tgagcgttag agaatgagac gcaaattccga - 360  
 tatgtagtaa caaggtagtc actcacagca aaagttgaaa gattcctagt ctacgctaac 420  
 aagtgtctgc aaactctaca gaaatgcaat tagaggttgc ggcagctact ccctgccta 480  
 aaacagcagt ctgaaaactg ccaatctggt gcaaattctg tcttttctga gaatatttta 540  
 agaaaagtgg tagagaaata ttgaaaggc aacagaacac taattatatc tagacaagtt 600  
 tccttttttt ttttcccaa aaata 625

<210> 74

<211> 736

<212> DNA

<213> Homo sapiens

<400> 74

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 tactctgaga agcaaattca tccaagtctg agccaaagag aatgaatcag aattctaagg 120  
 tttctgagtg tgtcttctga gaaaaattca gagactattg tgtacatttg tgtatattac 180  
 cttaaggac attaactgac acttccagag aacagaaatg taaatctggt aatgggataa 240  
 cgaaactggg ctgtgtcctg tgagctgatt gacagaagtt tagaaacgct gctaaacttg 300  
 tctttgagcc ctgataggag agaaagctca gcccatgtca ccctatcaa gtgagtggag 360  
 tggataaaaa ggaacgacca gcttgggctt aaaagctgta attctaggga aagataagaa 420  
 ataggctttg agatttgctt attgctaaat gtacagttat tagcctgggc atggaaaccc 480  
 cttagaaatc attaaaatga gccgttatgt tgagctcctc taattttatc cttatgaagc 540  
 catgatattt atatttccat taatagttgc atgaatctca atttacattt tgaaagttgt 600  
 caaagaacat gaaacaaagc agccaggact ggcacatttt ttgaaagttt tagaatcttt 660  
 ctgttggtga caccagtggg taaagaaatt tcatctttta actataaaag acacatgaca 720  
 tctgatgaat tagcca 736

<210> 75

<211> 607

<212> DNA

<213> Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; ()..()

&lt;223&gt; "n" is a single nucleotide whose identity could not unambiguously

&lt;400&gt; 75

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gggggtgtgtt ttggagcagt ggcagtgagt cattatggaa tgaagcttca gtgctttact      60
tacaagggga attccagaca tcagcctgga aaatgacgct acacaggtgc tgccttggtc      120
gtgcgcatag ggctgtgcac tggtgttcat atgaggggct gaagtgaggt cataggtgtg      180
agaagcattt acttggctac aagtaaccnn nnnnnnnnnn nnnttggaca agcactgacg      240
ttcaccattt gagccccact gcaagccctt gatggcatct aactagtttt gtacaacctg      300
ctgaaccata caaagatatt cactgggggc ccatcccctc caggccctaa aaatcatact      360
atctctcacc ttcacactgt gtaaccaccc tctataacta gaacatttgc tagtctcttc      420
tctgcataaa agtgatgatt catatctctt tcctctctgt tgggggttct gacctatgta      480
cttgtaattc agtcctcatg tttaaattct acacaaattt aaatttaggg tggtgagtgc      540
atagtggaca ctgtaaatat ttactaattg actaagtctg tggcattaac ctaaagcatt      600
atcattg                                           607

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&lt;210&gt; 76

&lt;211&gt; 615

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 76

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gggaatgtta tcttctgggt ttggcctcag ttcattattcc actgccccaa acaagatgct      60
ctaagaagca gtacagagct gagaactaca aaatataagc gacgtatatt ttctggaaca      120
tgctagtaga ggttacctga ccacaattag atatattctt gtactaaca aatatgcaca      180
ctaggaaaagt cctgctgagg gctaccacat taggacagag aaagaactcc tcttcccttt      240
atccaaaagt aaacagcaac gaatgaagag attgtaaaaa tagtaagaag gagctgacag      300
ctctcctaca tccaggcaac acatttttgg catgcaagaa aaaagtgacc ttattatttt      360

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tttaagaact gtttcatatc caagagccca tataaatctc ttcaaagggtt ttttaagatgt	420
ttaaaagcca ggaaatttag atgtttcagt accattaatg ctaacottgg cactgcaact	480
gctaccaatc aatTTTTTcc ttttagaaag aatgcataat tttgatgaat gctacagcaa	540
attacacact aaaaacgtaa tttttcatgt gaatggggcc aacgtctctt ggcatgcttg	600
tcatcacaat atagc	615

&lt;210&gt; 77

&lt;211&gt; 403

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 77

gggctgtctt aaggaatttg gacttcatat aaaggacaat gggataccac tgaagggttt	60
taagcaggaa aattgcatca gattgacgta catTTTtagaa aggtccctct gtctgcaatg	120
ctgaaaatat gttgaagaga gtataatcag agggtgagaa ctggatgctc ttgttaatgt	180
ggccacagat aatggatggc agtctggccc atggtaccag cactgagaac agtgagaagt	240
acaaagattc aaatgacaat taggagggtc aagtggataa agggagcaaa aaacaaagga	300
gtcaaagatt actccaagt gccaatcttg ggaaatttga tggataatgg gaaaccagga	360
tattccctaa ggtagggatt tgtgactcaa agctaataat aat	403

&lt;210&gt; 78

&lt;211&gt; 632

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; ()..()

&lt;223&gt; "n" is a single nucleotide whose identity could not unambiguously

<400> 78  
 ggggtggaca catgcgagat ctttttggag acagagttat caggatggac tggatgcaga 60  
 aggagggaga gaagagtcaa agagcaattc cctggtttct ggcttaagca actggataaa 120  
 tgagagtgcc acttactatg tttcatttgg cagggtgggtg gggaacattt aaaaccaaga 180  
 gctccattta ggacagaaat tgagatgcct gtgaggaatc caagaggaga tgtgaannnn 240  
 nnnnnnnnnn nnnnnncctgg actcagaagg aagggtccagg ctacagatat agaggcatca 300  
 gatatagatg gtattttaaaa ctttaggaac aaatgaacct acccaggaga aggcccagaa 360  
 ccaagcctca aggagcagcc cttagaggcc ggggagtggag cagagagtta ggaaaggtag 420  
 ctgagaaagt gtggccaagt tccatcctaa ctttgtgtcc attccctcca cagtggatgg 480  
 aggcctcggc tacctgaaag atgcaatgtg gtgggctgga tttctcacca gtaagtgggt 540  
 tgtttgttac taataacag: ggcctattga tagcagggt ggagacaaag ggaggggtgg 600  
 gtagggcatt tttgtctcta gtatggcaag tg 632

<210> 79

<211> 742

<212> DNA

<213> Homo sapiens

<400> 79  
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 ctttcgggtt tatttgttta cttacctact tatcttcaac acaactgacct acccacctgt 120  
 gtatcttatt tggtaacat ttatccaagt ttgaagatgg aaatagtttt cctctgaatc 180  
 agaactttca gtgtaactgt tccaagaaac cgccaccaca gatgtgggaa gagggaggag 240  
 aatgaggaag attcctgctg tctttttacc gcttgggttt acaaatgtgg caaatttgga 300  
 aaatgtcaaa aagtaggaaa aataaaatga aacctgagat ctaccacac agaaataatt 360  
 atagtcaaca tattgatatg ttttctcttt ttggaggaaa aaagttacag atgaacagaa 420  
 atttgaaaac aagctgtgcc tattttctgt ttcttttatt acacatttta ttatcaatga 480  
 atactttctg ctgtaaaaaa tataaatgat acagaaacca atagtagtgt tcccctttct 540  
 agaagaaact gtaaaagggg gtactgttca tcgccctat tcacgcttta aaggagatgt 600  
 ccagctccag ttgaaaatga agttttctta cctggcaatc tgggttttct gaatgtgatt 660  
 tgaaatccgc caccccaatg agaatgagga cagttttgtt tttttttcct gccaaagagg 720  
 atcgatcgta ttgattaatt ga 742

<210> 80

<211> 544

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 80

```

gttggttatta ctgtagtat taatattatt agaattattg ggactaggat gtggttcagg      60
tacctgaaaa gccacagtgc accctcagtc ccaggagatg gcagatctcc cctcctctct      120
nnnnnnnnnn nnnnnnnnnn nncagctgtc catttttgcc tgetcttggt tccctagtgc      180
taactgcttg cccctccttg atcctcagtt catacttctg agacaaggaa ggacatgagt      240
tgctcgtgc attacctttt ccttgtctgt gccgagcttt tcaggacaga ccagctcaca      300
gcctgctctc cagcctgagg cctggctggc ctgggtccagt tgaccatggt tggggtgagc      360
ccagctctag ttgatctcag aaggggaatg tgggcacaaa ggaaggctct ttaattatgg      420
gattttcaat tattctggaa agaggacttg aagagtataa aagaaagggt aaaataaccc      480
tgctgaagtg gcaagatgac ctttgtcatt tccacctag cataccaatt cgattccttt      540
tcaa                                             544

```

<210> 81

<211> 636

<212> DNA

<213> Homo sapiens

<400> 81

```

ggggggagtc agggccggaa gcaccggggc gagcgtctaa tccctaatac ccaatttttg      60
tggcgtgcac ctggcaaact gatgattgtg tgggacgtct aatctctagt cgctcacccc      120

```

tctactttac cacagagcta gaaatcgatt tgaggaaatc tggatatcaat gagcgggcg 180  
 ggagacaacc ccacccctaa tttccctgtt tacggaagtt ctttccggc ctctcagac 240  
 tgggtgctggc ttcctttttc tccacacttc tagctacctt gtttttatcg ttttcggcac 300  
 ctgcccttcc ccagcgcccc caccaccccg agcactatgt atgatcgggc tccccgcctg 360  
 ctcaaattgg ctgaaggtgg cagcactgag gcccatgtgg gtcctggatc ctaccaggta 420  
 cctttcctga agcagcaggc gacaggtaag atgtaggaag aggcagagct cctgtgacag 480  
 gcatcctatc ttcagcctgc tccgcttctg cgtgcttgtg agttaaacat agagcggaat 540  
 agtaccattt tgtaaacata acaaaacatg aagtaggcag ggaaaacact atacttttat 600  
 tttacagatg agactgatag tatcacttgt cccatt 636

<210> 82

<211> 570

<212> DNA

<213> *Homo sapiens*

<400> 82  
 ggggaatctc tggacacttc ctacttttagc agtactcaaa gaatagatat tacggccaca 60  
 atttcatatc agcaagactt aaacagtgtg cctttttctc acgacaacca atattatttg 120  
 ccagaaaatc caccttactc aaaaaaagtt gtcagagagc tatcaacaga caagttatcc 180  
 cccaacaaga gggaagacac ttgttgcaaa agaaaaggac tctgagctca agctaaagtt 240  
 ccctgaaact ctaagagcac ttgcacctt cagactgtat tcttggcaat taacctgtgt 300  
 ttaaaatgct ccctattcca aacaaccag gttcttccct gtcccacaaa tcggaagact 360  
 ttgttttcaa agtctgttga gtttaagtga tatggagaag gaaatatttc aggaccatcc 420  
 atacaacaat ctactttaaa aaaaaaacat gaatctcagt ttaggttcca gaacaatttg 480  
 gtgatctgca ctttaaacctt aatttgcata aacaggatgg aaagtatttt ccaaaccctt 540  
 aattcacaac accctgcaca cctgggcctt 570

<210> 83

<211> 526

<212> DNA

<213> *Homo sapiens*

<400> 83  
 gggggaattg tgcagaacag agagatggaa ggaggaaagg aacatgacaa tttacagaag 60  
 aggggctccg gcaccagaa ataacacacc acacctcagg tttcaggga caagaagtgc 120  
 tagacaaaaa ccataatgat tttacagga aaaaaagagc aacttcagat accactccat 180  
 tacaaaactt aaaaaaaaaa ctttctggaa ctaaaactga gttttaaatt taaaagttag 240  
 taatgaattc aaagaaagga aaacgaagta gaataaacat caaacagaa acaatggggg 300  
 agaagataag agatttggag gacatacttt ttccaaagca gtttcctcta tacttttagga 360  
 gttttaccaa cacacgcctg tgctgtgtct tttcaaaata tctaattggg aactacaggg 420  
 atcttaagcc aggaaaattc acttctatcc tttatcgctt ctcttgctgc ctccatctgt 480  
 gtctttttct ctttctggaa tttctactat tcacattatt tctcct 526

<210> 84

<211> 566

<212> DNA

<213> Homo sapiens

<400> 84  
 gggagcaggg gcaggctaga tttccagagt tcatcgatgt caaagccttt ctctgggggc 60  
 tgttccctaa tcccaaagca gttgctttct ttggctgcag aagctgccct ccctctggtc 120  
 cgcattgaga ggaagggtgc tgccttaagg taactggagg ataaggctcc gcccttccca 180  
 tgagagaggt gctaactcac tctcccacca cacatcctgc catccatcct gactttggcc 240  
 ccagggattt cagggactcc agcccagcat cctgggcttt ggcacctgct gccttttagca 300  
 gtctcacc cc tcttggaag tacttggcac tgcagcgtgc tgactcgacc acacctacc 360  
 ccagcctccc caggcctggc actgccacta ctgcccgtac ttcttcagcc acccttgaga 420  
 agcgagggtc tcaactcctga gccagtcag tggctgggtgc ctgctcctca atgatgggat 480  
 gatggactca agtcaattca ccactctcaa aacaaaactc agctcttcca agggagcaca 540  
 tctgagttcg ctctctcaa tgaagc 566

<210> 85

<211> 653

<212> DNA

<213> Homo sapiens

<400> 85

```

ggggctctgag ggcataaggaa ggtggcagtg gttagaggaa aaacaatgtg gtgttgtaa      60
aatctagaag ggagtcataa agtgcctagt gtttgagtca agatgaagac aaaaactgct      120
cacttaatta agtaacatgt aggctgggtga tttttcaagg gctttatgga gtgatggggg      180
caaatcaaag accgggatgg gttgagaagt gaatggaatt tgagcaactg gagagaacaa      240
gcaaatttac atgaactttg gctgtgatag taaggggagg atgtagtagc tgggtgctga      300
gctttaagat aacaaaagtt tcagcatatt tgaatgtagg tgggtacaat cacattgaag      360
gggcatagtt gaatataaag gagagaaaaa tctaattcac agtgagagat tcctaagtag      420
caggagatag gattcaagac actaagactg ccttggttat caggaaagct cctctaattg      480
aacagtaagg agtgggggtga tatctaaatg gggttctaag ctggaagtga actaacagag      540
ttcctttcat aaagtttctc ttgcccactg cccccactg aaataggaaa gggcatctac      600
taagaggggg aagcaaggag ttataggctt gaaaaaattg acttctaaat agt          653

```

<210> 86

<211> 609

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 86

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ggggcagcag aatgaatata tgcacattgt tctctggagt gaggcttcct ttccctgaag      60
ctgaggggtct gtgggagcct aaggggctcc ataaatctca gactagtagt attccagggg      120
atgatcgcca gcagcattaa gagctatgtt tagcctttat gccatactgt atctttannn      180
nnnnnnnnnn nncaaattct gaaacaaaac attaaaatgt gactcactcc aaacagaaaag      240

```

atggaaatgt attcctacta agaaatatgt gtaacttcta gaaaaagaaa aaaaaaccca 300  
 cagagatttg ttttcaacat attgtttttg ctttaagatat atttttactc ttaaaaatta 360  
 agaaatagaa ggccttttat tagaagcagt gtagtgtcac agaatgacaa agcacagtat 420  
 cagcagacag aaaacgtggg ttctaattctt gctttcccta cataactctc aactggttat 480  
 ttaggttctc aataaagtag aatgatgaaa tacgtcttct taatgctatt gtattttgtt 540  
 aatatttaac actgttgata tcaagatgag atcttataag tagctggaaa actatcagtg 600  
 tagggaaag 609

<210> 87

<211> 587

<212> DNA

<213> Homo sapiens

<400> 87

ggggaaaaaa aaaattcagt cgatttaaga taaaaagata ttcaagtagg caaatagggt 60  
 ttttaccatt ttttcctttt tgaatgttct aacattgttt agttaatcaa ctgataatca 120  
 tcatattatag gatccgagtt tcttacagcc taacagaaat gtgaaaagga tatttatagc 180  
 gaaacattat tttcccaact acaagagaaa atcaaagtaa gtaaacaaaa tttatgaaag 240  
 tttgctgtgc ttaatatgaa ttctccattg gtctgagaga tgatgctctc ctttctttgc 300  
 acagagtgaag agctagggtg gaatttgggc aggaaataaa gaatagagca agatactgga 360  
 acttggggga aaaatctaac tcttcacggc tgaagtcttc ataattctgc atcagtgcca 420  
 cagtctacca gaaaccaggc cccctagtgg attaaaagag ttaaggactg aatgccacat 480  
 gagaatgatt tcaacactga ggttgtggaa attaaataga agaacgatat ttaattaaaa 540  
 atcttattca gtcactcatt tagcacttct ttttcttttt ttcgaaa 587

<210> 88

<211> 589

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ( ).. ( )

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 88

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gggggtagcg aggtgttttc gcttagattg agtctatccg atatctacca acctcctttc      60
cttgaggagg cagggaaagc tggtcgatcc tgaaatgttt taagtgttat tttttttctg      120
ttgttttaaa tctagtctn nnnnnnnnnn nnnnnnnnnn nnnnagtctg aatccaaaat      180
ggctgtagct tggggaagtg ccctgccctt cgattactta aatacattaa cgttttaaaga      240
ttttagtcct ttcccctgtg gggacattaa ctgaatcttt tgatattttg gttttttgca      300
gttggtgtct cacctttaac tctccttatg ctgggtgaaa acaaagggtga ggctcacaaa      360
gttgactatt ccaaagttt acataaaaat ggggtgcgtg cgggtggtgtg tgtgtttaat      420
agttgcttat agttttgaaa ttgtgctgtg gtgtcaattt tatctgcaa cttcgtgctc      480
tgaagttggc ttgtcatatt tgttgaaata tttttaacat tgacatttat tgcttaccag      540
aaaaatacag ttaataatag tggttcatgt tttagtttag tagtaagtc                    589

```

<210> 89

<211> 573

<212> DNA

<213> Homo sapiens

<400> 89

```

gggggcggga aggagaaatt ctgggagtat ccctaccctc actttctatt acatttagtg      60
caaaacaaac attttaaaac tcaagctctt attctaactc tactgtaatt actaaatata      120
actgaaatct gtattccaca ggtaacaact tcctttgaaa accttctccg gaggaggttg      180
atatatttcc ctcaggaggt tggaggaatc aacaccctca ctccccaaca gcatttctag      240
accactgtat atcactgttt cccaacacca gctcgccttt tgaaatttac gtcagtttcc      300
acttctgata tgaggtcctc cttgacaccc acccctagaa aaattcctcc ttccctatggc      360
tcatgttact cagtttttac agccaggcaa caaattcata agtggacagg atatctctat      420
atagaaaact ccacaatcaa actccaattg ctattagggg gtgtgtgtat taacactggg      480
gctaagagtc agagtcagac taacactggg gctaagaagt ggggtgaaaa ggaggaatat      540

```



ctgggaatat gaccgggaaa attacaagta aca

573

<210> 90

<211> 589

<212> DNA

<213> Homo sapiens

<400> 90

gggtgatctg agatgggatc tggcctgagc ttctgctcac cctggcactt ctgttcgccc 60  
acttccttta gcttgggggt ggctgggtgcc ctctgggcta tgacaagggc cctcctgtgg 120  
ggctttgcat ggcccctgtg tccatctcgg gacagcattc tagcaccatc cagcttctct 180  
ggagtgagac tcgggagttt tcagtccact gaatgatgcc taatgacagc attccaggag 240  
gaatgcatat gcattacagg cccccacccg aagggggggt gggctgtgct ctccactcct 300  
ccgttccac atgacatcag tcttgtgaaa agctcccctc ttgcagagtt cagctataag 360  
gaactttgtg cgtaaaatgt tcttcagctt ccaactcaat tctatagcag tcgaagaagc 420  
aggcctgaaa gttgtcaagg gtaccttgggt tttaaccctt tggatttaga ggataatagc 480  
cagttaaaaa caacaacaac aacgacactc acacattaca ttttctgttt ttctcagaat 540  
ctctgaaaaa ttggacaatt cctaaaagta tgaaaaaagt attccttgc 589

<210> 91

<211> 711

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 91

gggggtgtgtg gtgggtgtgtg gaggttaagg gagtgttaagg aggtgggatg cactgtaggc 60

```

agggggctgg gtgtggagag tacatgctgt atgtgcatgt gtatatgcgc tggagggtggg 120
ttggagggtat gtgggatagg ttacagaaaa tattccaaga tgatatatga gacatcttct 180
ccagaaacaa aaatatgaat tgcatttcat ttctgtatta caattcttag tgctacagaa 240
tcacatgctg ctcccaatgt ctgcagggtc aatggaagag ccaaaaacca tttaaannnn 300
nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnntc ggaggtaaca catatttcta 360
gtcagaacac ccctgggtca gtaggtccag agtatggaca gagtctggct agcagggtcag 420
gaggccaaca ctggagggcc tggctcagca agtccttgtc ttccctggga gtccatgttg 480
tcttttctct agtgacaaaa gcctaagggg ctcaaatca caggacgcag catacccaact 540
acagtgccat ggggcaccca ggaaatgtct gaatgttttg ttaaataag tttagagtt 600
gtctctgctt acaaggaact gcctgtccac tgaaggggtg gcatgaattg tgacttagaa 660
gcatgaaaaa acaatatat tttagcagct accactgcta ctactactac t 711

```

&lt;210&gt; 92

&lt;211&gt; 652

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

```

<400> 92
gggtggatca gatgtgtgaa ccctgggtta ctctccagc atggagatca cccacccatt 60
acctacaaa gtggttgga ggagtaagaa ggaacatgca tgggaaaaaa gctttcagtc 120
tgtgcaaaat acaaaatgtt ttatagtcta aaacatagtc ccctgcatga acaacatcta 180
tccaaggcat gtaaactctg tatgtatggc ctttcacaga accagcttgc tagctcctgc 240
ttctctctaa agaattcaca cccccagggc cttgggagac ctacctgcgg ccatacagcc 300
ttcaaatggc cgttttctgt gcgatgctga tatcgatgag ctctgacagg ctgtgtttac 360
agtgcaggag gtcggagtcc tttagggcat ccatcagctt gtttgccgtg ttcccagcaa 420
aagatctctg ttgaacaagg gactgtattc ccaggaggc gaggtactaa ggggacagat 480
ataccacga cccaagatag agattacatg acagaatttg ttttgctctt cagaaatgtg 540
gtggatttca catttcatca catgcacagt gacagcacta tttaaaagga agtacctat 600
aacctggcct taacctgag ccatacgaga tgtgttcttg aaaaactggg tc 652

```

&lt;210&gt; 93

&lt;211&gt; 507

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 93

```

aatagaaaga aaagaaaaga aagacttgcc acagagcctc attccctggt atttcgaatt      60
ctgtagtcaa acaatgtcat cagcccatct ggtactgaat ctgcccttca agaaagaagt      120
tttacttcaa tatcacaaca gagggaaaacc cactaataat aggttagtgt catttactat      180
ttccaatat gacataagac ttagtttctc atatgcctgg ggttggcgaa tctgagagac      240
tggaataaa ataaataaat catcaaaaga cccctttgaa cattgatata tgtgacattt      300
gctgtcccat gataacagac accatgctgg gacaggaaag ttagcaaatc aaacgtttta      360
gcacatgggt tagagaggcc attatgcctt ctacaaaatc aacttctcca tttaaatttc      420
tgggcataat gatttctcat cactgatcag tatgttttaa aaggtgatag cctacacaga      480
gcatgattta ccaacactga ggtggaa                                           507

```

&lt;210&gt; 94

&lt;211&gt; 515

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; ()..()

&lt;223&gt; "n" is a single nucleotide whose identity could not unambiguously

&lt;400&gt; 94

```

ggggattggt aaaaatctat aaactatcaa tataagatac aagcagctaa attcaatata      60
tcagtgtcga aacagttgta caatctcctg ggaggtccat gacctctgct tgctcagtgt      120
cctcacctcg catctgtatc caccaatgaa gtcactgcat gttgccccgt gctggcaggg      180
gttggacgca cactcatoga gttgctctc acagtagctc ccagtatagc ccagggggca      240

```

ctgacagnnn nnnnnnnnnn nnnnattgat gcagacacct gaggctggc acaagtgttc 300  
 aacaagcaca cctgggaaac ccagtgaggg agaaatgtca tagaagaaca tgtgacacat 360  
 ggggttcaaa tcaaccaatg agcaagtaaa tctaaactgg ctgacacatc caatcttatt 420  
 cttagccagt tcttcacaac cctcagtacc agatgcataat taaaaataaa ccctgaaagt 480  
 ggaatatacc ttagtttcat ttcaaataca ttctt 515

<210> 95

<211> 543

<212> DNA

<213> Homo sapiens

<400> 95  
 ggggtcttac aaggggcagg ctgagaacgg gaaccctctc actttgcccc attctagtgg 60  
 ccaaagcaag tcacaagacc aaaccgaaac tcaatgggca gggaaataca gtccgcccac 120  
 gatgagcaat ggcattgggt tgaatggagg acaggaaaga attggagtta atccttcaat 180  
 ccctcacagt atggagggca ggggtctgtt acaagcagca agaggtaccc aggaaggcag 240  
 ggcttggttg tccccaccag caccacagac acccaacctc gcccaaagaa tggctcagag 300  
 ccacgctttc taggcatga aaggagagg ggcctttccc tcgtgacccc agagcagatg 360  
 gcagaataca gtctaggagg aagttccagg aggaacatga gaaacctcac aagcctcgtg 420  
 cagtttagtt tctgataacc acttctcttt ctttgtctca tgtttccctt ccttcgtgaa 480  
 gttcctagaa agtgtaaatt ttctcttacc tttaattttt tctttaattt ttctttacct 540  
 ctt 543

<210> 96

<211> 652

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

```

<400> 96
gggattgtat tttcagaagg aagctcaata cataatagct gtgcgtgagg ctgggtaact      60
tgcagaaaca aatagcccac ctagaagatc tttgcttcct atttccaaag aaatgtaaag      120
gcatggagcc agttgatttc ttaacatgca ttggatcact tttttcaggt tacataaaga      180
tatagttata tttttcaaata taagtttttag aaaaagacat gtaaattgtga gttaccttga      240
tttctttcca caagtcagaa aaagaagtag tctctgttac ttacaggaac ctgtttatct      300
tggtatccat aagtatataa atctatagta ttataacatg tctgatgata atttatagta      360
gttggcaatt tgggnnnnnn nr.nnnnnnnn nnnnnnnnnn ngttttcagt attggctgag      420
taagctcata ctgaattgac ccttctgcct gtagagcagc tctaaagtct ggacacagga      480
ccaaaaacga ctatttgaag gtagtggaac gtgagcaaaa ggaggcagga gaacaggaga      540
ctggacgaag ggaatagcat gggcgaattg tcccattttt ttcagacttt tagcttgagg      600
gcagccacag ttgacgacat gtgggagagt gatataaaat tcatggtctc tc              652

```

<210> 97

<211> 671

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

```

<400> 97
gggtcactta aacttagaaa tttcatcaag tgagcacaca gaaatctgta aagatattct      60
caagactatg tttagtatca agagaaattt ctgacacaat gcactcccag aaacagggaa      120
actggaaggg aatgtgagct cattcttga caaggttcaa ctactggaaa agcaattaat      180

```

ttgctttggc tgtgctaata taggggaatt agaaagtgtg acacaagaca aatagaaata	240
attagttctc caaaatgatg ttctcattaa tatggttcga aagtagaaa taaaacaaca	300
ttattgtggc atgtctgcat tctgtcccta accatgggag gtaggataat gcactataag	360
catttttata tttatagttt aaatgattat gtttttttct aaagaagaat ttatatcaaa	420
gagtttatat gcttagaatg tctaaatata tacatgctat caaattaata acacactttc	480
cataaccatg catttgtata ccaatttttt attttgctca tacaatctg tattgtaatg	540
nnnnnnnnnn nnnnnngggt tctttttctg ttacttaaatt attttcagat cacttttatg	600
actcttgaag tataacattt ctcagaaaaa aaattaattg tatttatgct ctatcttaaa	660
gaagccactg t	671

&lt;210&gt; 98

&lt;211&gt; 638

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

<400> 98	
gggcctgaat ggtgagttt caaaatctca tcttcttga tattggatga ctaatacagt	60
agtaaagtat ttgacaagtg ctagggtggt tataaatgtg catgtttttg aaacttttgc	120
tttatgtgcc tcgctgaaaa caatgtgtta gttcaggaat aaattatatt tggtaaatga	180
gtgtattcta tacttaatta aaatttttt tctttgtctg gttatatatg taatgatggc	240
gggagtccca cccgccctag aaaattattt tctttttatt tgagtcgttg tctagggtgca	300
catacaattt tatgtaagta taattataac atttttatgt ctgtatgttt tctgctacat	360
tgttttatca ttgctgttca tagattgatt tgagaaatag ttttcattga agtattattt	420
gaaagatggg ctaggcaggt agttcagtat tatactggct gttaacagta gcctatctag	480
gattcagtta gcattggaca taataacgat taattgacct ttgagtctct tacagatgtg	540
tttgacccc gaatatggaa ttctcatgga attttgagat ccatcacatt gtagtgtggc	600
ttccccccc gcaaaaaaaaa aaaagaaaag ggtaggc	638

&lt;210&gt; 99

&lt;211&gt; 700

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

<400> 99  
 ggggcagttt gggagtgggg agaggattgt tttgactgat tgagtctgag atagttgttt 60  
 taattccgtg cccatgactg aaagggaact atctaggttc tgcagggaga agagcagtca 120  
 tgttgcataa tatagcaaat gaggaccacc caggtgcact gaatggccac cttttccaga 180  
 ttgtagatcc actctggctg cagtgcagtc agcgtgcatg tcccgccagg acccccgctgc 240  
 tgccctgtga cccccgcccc atgctgaggg agccacacag tgtccatgtg accctaacac 300  
 atgcctcccc gccggccctc ttttttttgg ttagcaacac actcacttgt aaaaaaatt 360  
 tctagatggt gtatggcacc acaaattaaa agagactcct ttgaaattta ctcacctctt 420  
 tgagcttagt agatttggtg aatgaggatc tgtatggctc atgagtttac agatggccaa 480  
 actcttgag cacatttacc tcttactggc tgctgactt tctgaacctg gtgagctgac 540  
 taaaggtcag aagctgcacc ctaatgaaag actggacttt agtttgtgtg ggtatcatca 600  
 ttaatacttc attggacttt tctatttctc tggaatgaat tccagaaatt atattatgat 660  
 gcagaaaaat aatcccaaat ttgagtaatc ctatcccact 700

<210> 100

<211> 637

<212> DNA

<213> Homo sapiens

<400> 100  
 gggtcaggtc ttctccatta actaatacca actgtggaca cttttctttt gcatctctga 60  
 cattcataag tttcttaact ccaagtttcc tagcttcata gttgcaggta accaccaaatt 120  
 atttctgttg aacccccgta aaaaatattt tatgagaaac ccaagcacia ttgaagaaaa 180  
 catttaaaga tattattaat tccgtattac atttgtctaa attgtaagac aatcagtttt 240  
 gataagaatc aaaagccctg tctcaattaa aaaacatagc ctccatatat caaatctcta 300  
 taatgcagaa acattagggt ttcaagctat ctctaatta tgaattataa tataccaatg 360  
 tattatTTTT ccatacccca cttttaatct ctagtgtttt tgtctccttg aagaaggaaa 420  
 gttattatta aataacaaaa cactgaataa cacagaatta aaagtttagac gatagatcaa 480  
 ttattcatat acaaaaggca atctatgtat tacatttcta aaatttataa atgaacctaa 540  
 atcaatatat tctatggaat cttcagtgat aagatacaaa tcaaatctct ctaggatttt 600  
 tttccagaca atataaaagc agattaattt atactgc 637

&lt;210&gt; 101

&lt;211&gt; 663

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 101

```

gggtgtttct ttagtgacag tgcgggatca tcatcaggta ttctgggaaa ggaggggatt      60
tttaggtaac ccccaacaca gcctcgttgt ctcttactcg ggttttcccg ggagaacaga      120
ggacacatca cgtcgggtggg ttgcgcttct ctctccctcg ctttgggttt tctgccqccc      180
tgtggttact ttgccacgtt cctgtcttcg ctgttgctcg ggttttccgt cctcctgtga      240
ccaccagtg ctattcttgt ctcaactgg gtaagcagaa attccagcgt ccagcgacat      300
gcagccatgg caagagctcc gggcaggaga ggcggcgtgt gctgctggag taacctctgg      360
ccagccacct gggaagacc ttgccatcgt ctgccatcga cctgccatgt ggggaacccc      420
gagcccagca gctgcccgca cagaagatca gggcagccct cccggctcca ggttacagca      480
gggtgctgca aagactgctc acaacagcag cctgggacaa gccaaacgtc tgtaataact      540
gaataaatcg tgggtacata aaccgcagta tatccagaca acagaacgct gtatagcaac      600
tgaagcaaat ctacagaca cgaagtgaag aagacaaatc agaaaagaac gcacttaaga      660
aag                                                                                   663

```

&lt;210&gt; 102

&lt;211&gt; 598

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 102

```

gggttacagc agggaaccta aaacctagac ttgggacccc aagtcctcgc ttcacaaaaa      60
tcatgacatg ggtgttgaac cagtttctgt tcagccacac agaaactcat tcaagtcctt      120
caagaggaag aatcccacct tcaactccac acctcctcca gcaccaggcg gagatgctcc      180
tgattccact gagaatcctc ctgccacac aagcaggaaa ctcggggcac tcaagtgcctg      240
ctctctcacc cactgcatgc ccacagacct ctgcaaaggc agctccttta ttcccccaat      300
cctgaacatc tgtaagtgc taaggcctca gagggggcct tttaaacagg cacaagtag      360
aaactaccag ctttcacca ctctacctc atccatcaga aaacagagcc accagccttc      420

```



cagggtaggg ttcatcaagc cttttcctcc ccatggaact aagctgtaca cagtagtcag 480  
 agataataa tgtctaagcc aaaccggctt gagggcacat atggagggtgg ggggcagagg 540  
 gacactggcc tgggacctaa accaccattc agacctcctc tttacaaaat agtatact 598

<210> 103

<211> 401

<212> DNA

<213> Homo sapiens

<400> 103

ggggggactt aagagtaatc aaaagaaact tcatggcaaa ggtgagagct ggacaatatt 60  
 tgggtagaat gttttggtaa aaaatgtttt ttggtatcaa cctatacaca ataacaqaac 120  
 tccaaactcc atttcttttc agagataact attttataag tgaacctttt acttgattga 180  
 aatagtagat ttgatctaag tacagcatgc tgtccagaga ctatgtccaa catgtctgag 240  
 caaaacattt acaacttaag ccaatagtaa tgcatactgc ttttatagca gaatttccac 300  
 agctctcagc ttctagggtt ttatttggtg tacctttctc taaattctat tgaaaagcag 360  
 aagaatatag tggttacaat atatagagaa gcaaggtggt t 401

<210> 104

<211> 640

<212> DNA

<213> Homo sapiens

<400> 104

gggggagcaa ggatacaacc agttggcggt tttcaacatt tcctgtccag tacagtgaca 60  
 gtattctttt atggaacatt aaaggcagtc tccttcatac atattatttt tttttaaaac 120  
 aagtgttttt gttaattggc tcatgactaa cggtcattct acaagacagt gataaattag 180  
 ctattggatt attacctgtt agtcgtggga ggaatttttag tatttatgtt tttatttttt 240  
 gttgatagtg cctaaaatta aaaacatcct tcaattcctt cattttatga ttgattttat 300  
 ccttcactac cttaaataac caactggttg tatecttgct tccccctcgt tccgctctgc 360  
 atcctccttc ttcccccttg ttgcattac caccattctg tagtctgaca agactttgtt 420  
 ttttccatta accttgaaaa tggtattttt tataaatctt gtatccacct tctaaagtc 480

attcattctg cacagtttgg taattagaat gagaatgtgg caagtgtgca caaggcatct 540  
 gcttttttag aataaaaaat aatattcttg actttagaat agaaaggggt tcagaaatct 600  
 agttcaagcc tcttatttga aataatgcc aagcaaagtgc 640

<210> 105

<211> 567

<212> DNA

<213> Homo sapiens

<400> 105  
 gggtaggtaa caatgggagg agtggggggc taaggtagac cagaaggata tgcttgggga 60  
 gaaatggcaa cagataacca ggtccagcca ttgtcactat gcataatcaa gggcctgtgt 120  
 tgccaatttc tcaggggaaa ccagagatca gggttttcat gtgaaacctc gtgatttcta 180  
 aaaatattag caactcattt taaaatgcac tgggctaaca gtctacaaat tctgggtgtg 240  
 gcatactatg cacaaagggt tccatactta agaaattcag gacacactga gttgaacaca 300  
 gtgcaacagg cttctccctg cagaccttgt cagagccttt ggaactccaa agtatctgtg 360  
 gttctccgag aagggggcgc tatagttggc agcctctctc aattcactgg accacaggac 420  
 tctggtttgt ggaattcctg ctctgatgt cttagcaggc agggctggga gctgctctct 480  
 gctgcccgtc cccaagggt aagcatctgac tataagcaaa gcccctggg ctctgggtcc 540  
 tagagggcca tttccctctg cacacaa 567

<210> 106

<211> 461

<212> DNA

<213> Homo sapiens

<400> 106  
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 cctgtgcccg ggagtgccag tctcttcac agaaggagga cgcaaggcca cccagctctc 120  
 caccaatgcc tgtcattgac aatgtcttca gcctggcccc ctaccgtgac tatctggatg 180  
 tgccggcacc cgaggccaca actgagcctg actctgccac agctgagcct gactcagccc 240  
 cagccaccag tgaaggctcag gacaaaggct gcagggggac cctgcctgcc caggagggcc 300  
 cctcagggag taaaccctta aggggctcac ttaaggagga ggtagccctg gatttgagt 360

tgaggaagcc cacagcagag gcctcccctg tcaaggcttc ccgttctgtg gagcatgcca 420  
 agcctctgca gccaaagaaa ataaaatact ggcttccgga t 461

<210> 107

<211> 519

<212> DNA

<213> Homo sapiens

<400> 107

gggaagcagg gcgactcttt ccaggaaggc agtacttact tctctgttct agaaaatgcc 60  
 caggattccc ctctgttttg gacacaccac acttgcacct atgagtagcc tgggcttcaa 120  
 agaatattga ccctagggag gacaatgaag gatgcaactg attgggctgt tcattctcag 180  
 attttgcta cacaggctgg aggtggactc cagtcctctt agattccctt ctagttccaa 240  
 tggcagctat ctgaaaagaa ctctaaacct cagttgcatg taaagacacc tgttggactt 300  
 cagtgagcct gtgaacaaaa gctacgtaga cttatgagga atggcttcca cgtccacact 360  
 tgacaaatgt cttacgtggg gtgaagaatt aaacaaagat aacaaaggat aattccctgt 420  
 tctctgaatg cacttgattg gctctttctt tcaagaccag atctgaattt ttaaagaatg 480  
 gtttcagcga catttgctcg tagcaacat tcaaaaatc 519

<210> 108

<211> 578

<212> DNA

<213> Homo sapiens

<400> 108

catgtctctg aagcatctca ccaagaagct gctaaaccgg gatatccagg tagcatctcc 60  
 ccacatcccc cgccccatc ttggacatgg ctctcgttga tgcccctagc cagactctga 120  
 tctcagaagt cctgtggttg tagagatcca ggtgggctgc tgtgatggga agagctccat 180  
 ctgtacacag gataataatt cctgttgtct acctcataga atgtttcaaa gtgtgctttg 240  
 gaaaagggaa aaagtcctaa gtagatataa aaccctaact aaggaagaaa gcaggtagca 300  
 gtggtggtcc aagagaccgt gtagtggatg caaggaccgc tcgtatttta cagctatat 360  
 ttcagcaaag ggtggcccat ctggcaggaa gatggggaca tatgtcacat atagagcagt 420

taaggaacta gggaaagtgg aagactcaga agacctgtct ttgacctggt atgttctatc 480  
 tctacagaac ctaatatggc ttatacatatc tgccacagaa aggactgagg tagacagtgg 540  
 caaaggcttc ctaggagttg aaccctgaa attacata 578

<210> 109

<211> 587

<212> DNA

<213> Homo sapiens

<400> 109  
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 gtttgcaa at caccctact gtatactgtc atctgatttc atccttttca tcctgacttg 120  
 gataaggcta acgagcaaaa gagctgtggt ttttctttgt actgccatct tcttgagcta 180  
 ttaggtaatg ctgacatact gctagaatat aaaaaatttg ctggagtatc aaaatcatgt 240  
 attccttagt gtggcattta atatttttta attatgcaga attgaagtat aaaaaaaga 300  
 gaaaaaaatc ttcctagaaa aattgtaaaa gatgaaagcc caaaaaactg caaaaccctc 360  
 cctaaacaaa aaccaaatag ataaccaag gtaatatattt aatgtgcatt cttgtgggtt 420  
 tatagctatg taaatataca tagttataga tcagtatatg tgtgtacaga taaggaatgc 480  
 aggaaagcta atattgattt ttttatgcaa caatcacagt attaagtaat ttacatccat 540  
 tttttttttc ttttaattca taccaaacc ttatgaacca gggtttg 587

<210> 110

<211> 563

<212> DNA

<213> Homo sapiens

<400> 110  
 cactagagct tgagatgagg ggtagacata ggtggtggag gttgccaggc ctgagctggc 60  
 agagatagag agatactcct tagagatgat gagaagaaag tgcaggctgg gggttttgag 120  
 aaaatctgca gtaatatggg actctaaaag actctactac cctgtgcaag accccctcc 180  
 tctatgagct ttcctgttca tgctaactcct gagaacttcc cattccacag gtttctgcag 240  
 ctctaattgtg ggtcctacag tcacatccta ccttatttta caggtagtta ttgcataact 300  
 gctatttgca aatatatgtc agattgaaat aaatgacaat acttacatgc aaagatgctc 360

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agggcaatat tatttataat cacgaaaaat tgtaaacaaa atatccagta gaagattaaa 420
ctgtgcagac ctctaaaca atagtttata acatataaaa tggtcacatg ctgtcaagtg 480
gaaaaagtaa acaacaattc tatttgcagtg ttttgtaaaa accaaaaaca aaagattgga 540
agaaaacata ttgaaaagtt aga 563

```

<210> 111

<211> 503

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

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<400> 111
gggatagtaa tttccatctc tgagtttgat gtttttaatc tgtaaaataa gggcgatgga 60
ctagatgagg atttccatgt cttttctact tctaaatata agaccgcttt aaaaatagca 120
gttttctatg ttttttccag ccagcacac tggcaggac tctaatgcca ctgaagtctg 180
tgtcagaaac tctgtaggg cagagtgagt atgcaattga atgtgcacat ccttaatacc 240
ttataaccagc aactctgctc ctccattctc tatacccact ggaaaatcac caggctcctt 300
gatctctaataa tgaaagatgc cactcattac agcagacaca gcaggcagca ggggccnnnn 360
nnnnnnnnnn nnnnnccttc atctccaatc gaaagatgcc actcattaca gcagacacag 420
aaggcagcag gggcctagga caggcagaag gaggaaggag cagtgagcaa ccagcctccc 480
atctaggaag aactgtggaa cac 503

```

<210> 112

<211> 645

<212> DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 112

```

gggatggtga aaatggcaaa ataaaacaga ggaagataga atcattatca atgtaattat    60
attatggttag atggtccagg ttacattcag ataattaata tccaagttct gaggttatag    120
agaaagcata tttagcaag aaaataggaa caacaacaaa gagtcacatg tatgtggttg    180
tgttacatca ttttctctaa gtattcagta tgaaaaagcc atgacataaa aatactgttc    240
aatctttaga agtacatfff taaaaattat cttaaaacac catattattc tctctaaaaa    300
agcagaaaagg tttctctctgc ttgaaatact cagatattat aaaaatgttt aagaaattca    360
tgaccactga tagttgatgt ttaggtttcc atagtttttag atgctagaaa aaaataattc    420
catttacttc aagtaaattc cagtattcaa aacactagac aaaatatgaa taattattgc    480
ataattaaga aaatgtgcta atgcagtatc taaggaaaag gaaaaaatt tctaaatagc    540
aagaaacttc accactgttc tcttctgac tctcctctgt catgctaagg ctgctgaatt    600
tggtctacaa attctctcca agcaaaaccc tctcatcact cctgt                    645

```

&lt;210&gt; 113

&lt;211&gt; 605

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 113

```

gggaacaaag aaaaattaat agacggaatg gaggcaaagg tgaggctgaa tgtgagatac    60
ctacctataa atatgaatgc aaccctaac aaattcgtag gcagactgaa aatcatgtgg    120
gcgaactggt tcttgaaaac tatttgtaaa actcctctag tgggcccaaa gagttaatac    180
actcccctaa acctcttctc ttctcattaa gttgaactct ggaaagtttg ggtgaatttt    240
cacatcatalc attctcaacc acaactagaa atccagaagg cgtgtcaaca aaatctgtcc    300
ctggaagatc tgccctgaaa tctactctct ggagcaccct gccacgaccc agttttgtga    360
catcaatgcc ggggcatatc tgggtgttaa ctgctctgga aaactcccggt gtgagaaatt    420
caggccatcc aattaggaca cttccagggt acctctagct taaacactct gactggtttt    480
atcttattag tcttcatcac atccctgttc taggctaagc tttccctcag ccctgtgct    540
gcttttagaga agcaatggac agattttgca tagaataaaa aaaattctta atttccagcc    600
atcga                                605

```

&lt;210&gt; 114

&lt;211&gt; 446

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 114

```

gggagttcct tgaccacaat atcaatgtta ataattgggt taaagtacag ggcccagtaa      60
aacaaacagt tgcaaacaaa ctgaggggatg agggggccaga acatgaccac aaaaagcccc      120
tgcgttgata ctttccagaa atggetccac atcctctgag gcacggtcct aaaacaagaa      180
gagaagaggc tgaatcggag gcgcttctca tgaccacacc caggagtccg ggccctgggc      240
cttttctggg tgctgggaag agcatggctg cccgtgctga atgtccttgt cttctgtccc      300
cggtgccctga gacctctgcc tactcaaccc atcttttaac totcaaggac atgacctaca      360
gggagcttct ttgccccac actgggcaag gcctccctgt gacagcctca acttcacctg      420
cttcatcact ttgttacatt tacata                                         446

```

&lt;210&gt; 115

&lt;211&gt; 493

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 115

```

tagtgcctga ctaaatttgg agataaggca gacctcagga tgaatcacag gtttgaagcc      60
taagtgactg gaagaataac ttctactgaa agaaatgcaa agtcagaag taaaattagt      120
ggaaaggaat gattctaatt ttacttgag tggccaaca caatcacagg atagtcaaat      180
cgatgcctta gtgttataaa caatatgaca caaaggacta atagaacaat taaaacaata      240
tagatataag aattaaggct gggattcccc ttttaccgcc ctctagtcaa atccaattaa      300
ctttttttca atgatcatgt taatgaocat ttatctttga taactttctt tacctttggg      360
tcccataaca tcacaatata gcttctacct ctgttcacca ccacacctag ctctctgttc      420
taagtaaact tagtattctt cagtgatctg caaaatcctg agtttctaata tatatttctc      480
taatttgaat tat                                         493

```

&lt;210&gt; 116

&lt;211&gt; 610

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 116

```

ggggtacacc aggcctttgc gttggacgtt ccacaaaggt agggactgac gtttattctc      60
gagtcagtga tgttctggag caaacctaa aaagaaacaa aaacctaccc tctattgtat      120
ttgcaactgt ttctgctttg cattgtcatg tgtggtttga cctgcctttt ggatgttttc      180
ctctcctgaa acatcgccca gtccctgggt taacctggaa ggcgaggggg aaggaaggca      240
acctccctgc taaggttcca ggcagtggct ttggtgttgg aagtggcact tgacgatatt      300
atgaaaagtt tacaagtcct tcctagaaaa gatgtaatta ggaaaaataa aatacagaag      360
aacgttgagt atgacgcgtt tattttaaag ggtagtcctg tctcaaatgt gctgcacatt      420
tttgtgaaaa gccaccaagc tgggtaacta atgcaaaca caaaagttgt tcatcactgg      480
atcaccggcc cttaaagcga ttccagccct taatagaaca cacacctgta gggcaaatat      540
ggagatttgt ggtgtagtgc tgccaccctc gctcccaac tctcaagcat ttgcccctt      600
tacctcagag
                                                                                   610

```

&lt;210&gt; 117

&lt;211&gt; 538

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 117

```

gggatattag cagacaaaga agagtaggga aacccagct tggggttggc attcaaggt      60
tcagaagctt ggctgttctg aatcagagaa atgaattttt gtgaactgac cattccttgt      120
tctactaaaa aagctagcat cttttacatg gaaacacca ggtctcttgg cctggcacta      180
gatcctcccc ttgatctggc cctacctgca ctcttcttag tatctatgtt cccttcacat      240
caagccttct agtatctatg ttogcttcac atcaaaccat ttgctgttct ctgttcccat      300
cctccacttt ccagccctt gcctttgctc ctgatgtagc ctctgccgt gcttccccta      360
ctcttctttg tctgctaata tcctgcccac ttctccata aagccatctc tgactgttcc      420
cttcttctaa ggggtgaaaa ttgttttctc tcctctaaca tctgtttctg tccggggctt      480
gttctaccct aaatatcagg gtatttttta tagttatggg aactgacctt cactaatt      538

```



&lt;210&gt; 118

&lt;211&gt; 500

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 118

```

gggggttaaaa aaatctgagc tatcatataa caagaacgca aaatcaggag gactgatcaa      60
gtttaaaata ttttaagtct attggtagg ggaataaaac taatgactaa ctttagacta      120
agtgaaatat tcatgttaaa tttctagagg aaccactacc aggtggaaac agaataattgt      180
atttctgcag ttataaagaa tgaagtggga aaaatctaaa gaaaacatag acagcttctg      240
ttattcacat taaatgtgct tttcgtacct tagaaaacat actgtgtgtg tgcattgttc      300
aattttgggt aaaacagcaa agtaattgat agatacaaca tttctttctc tttcatggca      360
catgaaacac aatctgacct tccctttagt ccaagtttaa tgctcaacag tgttggactt      420
ttctaggaca aattgtggca ttttatgtat ctacgaaact actgacattt aaatgtcttt      480
aaattagata taacattgaa                                     500

```

&lt;210&gt; 119

&lt;211&gt; 739

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; ()..():

&lt;223&gt; "n" is a single nucleotide whose identity could not unambiguously

&lt;400&gt; 119

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ggggggaata agtgaagtgg ctgaaattag agttgcgttt gaggcaggct gcaagccttc      60
tgctgcctg agcaaggctc cgtcctcgcc tgcttcatta ttctagaaag agcttggctc      120
ctggtggcat cgctatTTTT ataccctggt ccaaaggagc catgaagtgg aaaaagtgat      180

```

tttttaaaaa atctacactt aaataaacca aaagaaatgg cctgtggctg acattttgag	240
atttacagaa ctccagcaaa aagctaagga ctgggggatc ccaactcacc atccaattcc	300
taatcaaagt tgcacaaact aaatatgtaa gcacatttac tgctcaaagt tctcagtaaa	360
gggtgctttta ctgcagtttt tctccacta aaaactgctg acaagtaatt gggacatttt	420
tgtcttgccc tgagaaagct agactgtcta gttaaaagat aataggaaac tcattctaaa	480
gtgtcatctt attctattgt ccacagggct gtccgatttg ttaatcttca cttagctgag	540
cctgtgaaag gtggattcca ccgtaggttc atctttgtgc tgtagtggtg tgaagaggtt	600
tgaacaagga attaaaagcc nnnnnnnnnn nnnnnnnaag gtcttctaga gggcatatcg	660
agctttattg acgattttat ttccacttga tacatgactg ccagcaaact gtttctctta	720
ccttactatt tcgtcatct	739

&lt;210&gt; 120

&lt;211&gt; 570

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

<400> 120	
gggtgggtgt tagtcgagac cggggggcgc ggggcgtgcc ccttggtcgg cgtcgcagcc	60
cgatgggctg gctggttgct acctccgggc gaccaggggc ctggggactt cgtgcctggg	120
ccagggtctc ttctcttcg cgggcacagt gaggagactg cgaggtgagg tgcgtccggg	180
tggatcccgg gctgcggcga ctgtcacatt ctccccggcc agaccggagg tggagcagaa	240
ctgggggcga cgagcttgac tgggattgca gctggacgta tttaggttca aaacatcctc	300
ctcctggctt tcttcgctc cactctttgg tcaggaagac tggggcgggg tccccccaa	360
cccatgccct caaattgctg gcctagaggg cacagcgcct ttctaaaagc tgcagttggg	420
ttgcctctaa aataatgaag ctaacccttg ctaattgtgg ggaaaagata gccagaagca	480
gcaaatttct gctgtggacg tccgatataa actgatactc ttgagatggt taatgcttag	540
ttggtatac ctgccccccg cccccgcgc	570

&lt;210&gt; 121

&lt;211&gt; 488

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 121

```

gggagggtggg gaatagggag gagaattgcc cttatcaagc aaattaacta catttttagg      60
aagaggatag aacaaaagac aagcagttac ctattcaaac tcttcaaagt agtatgaaac      120
cctgtttttac aaactgatct gcaagcaata tagaagggtg tagccatctg gacatcatag      180
ccctaagttt tatttaattt ctaagaaaaa aaactacata aatttccttt cagtagaaat      240
tattagttaa aattacaaga tactgcaaag gaaacacata agtctgaaac agcataataa      300
gcaccatttg ctctgaggac aggttctcat cattttctcc caaaggaggaa aattttccaa      360
agtatttgaa aacgttcaca gagaactttc ataataccca acaataaata acacatagtt      420
tcagaaaata tcaaaatacc tgtgttatat aatcaaatga atttcaaacc catttttaaa      480
tatttcct                                     488

```

&lt;210&gt; 122

&lt;211&gt; 503

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 122

```

gggggtggtt aaagatgcag taatggcaac agctgaacct tcaagagaaa aaaattggct      60
aaggacagga aaaaatattc cttcttctta gttatatata tttctattta aaggggaagc      120
caacagagct gggggaaagg aaggaggga tgtgtacact gaagtaactg gcgttggtaa      180
tatatttaca caggacccca gttttaaaaa aaagggtggg ggtgaacaaa taccttcatt      240
taccttatag ttacttacc tgggtccttg aggcataagt gaaatagcta ttctgtagtg      300
tgagctctct gccccaagca aaaggcaacc tcccttcaaa gtctgacagg ttttttcagt      360
caattgtatc aggttgaatt acatgacact gacatttttg tatgtcaaag gcagaatatt      420
ggcaatttca tgtggtccta aagcaacaat cccccctcaa gtgattacaa tggtagacct      480
taaggctttc tgtttttcta ggg                                     503

```

&lt;210&gt; 123

&lt;211&gt; 405

&lt;212&gt; DNA

<213> Homo sapiens

<400> 123

```

ggggtttggg ggctgcagac ccgggagcta cagacccaga aggtgaaggt aactgcaggt      60
cacacctgca tgggtggagct gtccgtgggc cttctgagaa ggaggaagta gacgcttaga      120
caaagagtac gcggcgcaag ctctagaact tgggctcagt gaggctgtcc agtgagggtcc      180
agtcagagta atgtgggcag ggcagggata tgggggctct gaaccccagg atttgtgagg      240
ttttggttga caggcagagg tggggagaca tggaggtgga aactgatcat ggggacaggc      300
attaaggcag agggcggagc tacaacctga agtatcggga cttcctggcc aacagacgga      360
ccaagccctt gtcaatagga aaaacaaaga tttcaggtct acagt                        405

```

<210> 124

<211> 423

<212> DNA

<213> Homo sapiens

<400> 124

```

gggagagggg aatggctgga atattcgtca atctgtggtg ctttactgga gatttgcagg      60
agttcagagg aagggggcat tgaatttcac aacctaaacc gtatcgtggt ttaccagaaa      120
gttttgaccc gtgattccgg ttttaaaggc tgagtagggc cgggcgcggt ggttcacctc      180
ctctagtatg cttacaaaat gagagtcctg gaatagcaga catgcattgt aaataaatga      240
acatctttct acaagtatat ttccccaagg ttcaactgaa tatagtttgc tataatttct      300
taaaattcaa tcaatttcac atccattaaa cttacaagta ccgtaatcca gttttcctag      360
gaaaactaag ccagccgaa ccttgggaaa aatacctctg tgttaaacat atatacatga      420
tcg                                                                423

```

<210> 125

<211> 511

<212> DNA

<213> Homo sapiens

<400> 125

```

gggaaatatc cgtgcctgtg gcagatctca ctcatcatgc ttagcattct ctcccgcaa      60

```

```

gctgggataa gcctcatgtc ctaacacagc acaacaggag gtctctgtca gtccatcaga 120
gatgacattc tatgtgatat ttttgacatc cttgtgctaa aagcaatggc acaaaatgga 180
aaagggccta ttgaccacac ctactccagt aaaaatgttc ttcatttatt ccttaatttt 240
ctaaatctga ccccttttaa gcaatctagc aaattgagaa tcctcagctc tccttgata 300
cctgatattt tatttcaaga aagagacaaa gaaggaaaat tttatttatt ttactaccca 360
catataaacc gaaggagat gggactaccc aaacatttgc tgctcaattt tgtgtcttgt 420
gcttgaaagt ctgcccta at gcataacaaa aactacttgt ctctacctt ttgggatccc 480
ttaacaagt atttgccctc tgaactacgt g 511

```

<210> 126

<211> 457

<212> DNA

<213> Homo sapiens

<400> 126

```

ggggaaggga gaagtcaggg aagggaact tctgaatgga taaagatgag cttaaaggaa 60
agggcagctt aatcaaata cagtcacctt ggactgtgat ctgctcacag gtacagaagg 120
gacatactta atttaaggtt caaatccaa taggaacctc agtgaagggg tgctgcagtt 180
acattggctt ggcttgctta gatagagaag cctcagtggg gtatataccta cccagaaaa 240
gattgtcttt tttttttttt tctcagcaac ttccaataac agtgaaagtt gagccacctt 300
gggccagagt tgagggctat ttcagaagct cctgtacagg aagattgctt gggtttgatg 360
gtccctaaac aagattccca gtagttggga aagatgggga ggcaactgtg gcaagtctgt 420
ggaaattcgg gccctcacgt ctctttttaga aagaagc 457

```

<210> 127

<211> 482

<212> DNA

<213> Homo sapiens

<400> 127

```

gggcttctag aaccattaaa aaaaaaaaaac ctctggccgg gcatgggtggc tcacgtcttc 60
ttttatctgc atctctact tcaataactg atattacctg atctggaacc tggagagtca 120
tccttgaatt cttctccccg caaacacagat tcctctctct taatgtgcct tgaacctgtc 180

```

ttctccccac ttctcccttc taaatagcct tagaccaagc ctcacatctc tctcccagac 240  
 cactggcttc ctcacaaatg tccttgccctt cccctagcct cacctctcca atggattgcc 300  
 catatcacag ccagaggatt tttttctaaa aagacatcta tctggaagac ataatcagat 360  
 catctgctg tatacagaac tttccaaggc tttctgtgcc caacagagaa agtccaaatg 420  
 taataaactg ggatgcaaca ccctcaattc tttttttttt tttttttgag atggagtctc 480  
 at 482

<210> 128

<211> 733

<212> DNA

<213> Homo sapiens

<400> 128  
 ggggtgcctga catgtttgtg gccttgccat gtagtttcat tattcaccac tctcagtggc 60  
 ccaaggtaaa ctccactttg ttctagaccc atttgaaaga tgagctccag gaataaaatt 120  
 tacttaagcc ccttttttct tttgggaggc gaacctggaa gtgggaagaa gagatatagg 180  
 agctcaactg gaaggatgaa tttctgacag tataatttat tatgtatgat tagcagataa 240  
 ttaggacttg tgcaaatggg agttggcagc taagcctagt atagatccac atcatggtaa 300  
 aagttacatt ttaaccatca gtcaaacctt taaaaggact tctagcaatt caagctagct 360  
 gttttgtgat ttaaaatggt tacctgcccc acaaagacca ctgaatgac acaggttatt 420  
 ttctagttaa ttacagggt tgtaatttt gcttattggc tctactgattc attgcctgct 480  
 tcttgccac ctaatatattg ttgatgaatg aataaatggt agatgtatct gccgaagatg 540  
 gaatgttttc caccatgtta attttacttt aattagaagt ttactgtgg gacttagaat 600  
 ttaaaaaaaaa atcaatagat ttgagatca tgtaagaaga aatgtttggt ttagatttca 660  
 agcactatgg ttttgtcatt ttgatgaaa gtgtttcaca ttttttattt acataactat 720  
 ttggagtggag aag 733

<210> 129

<211> 546

<212> DNA

<213> Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; ()..()

&lt;223&gt; "n" is a single nucleotide whose identity could not unambiguously

&lt;400&gt; 129

```

gggaggcagc agaaaaccca tgttgagtgg tcaagacatt tcacaagcaa ggaaagggaa      60
acagtcaagc tataagaaag tgtttatgac catgggcggt cataaatgaa gatcctccag    120
cttttggaca ccgcagctta tctcttagtc tctggtttgt ttctcttaga atgattatga    180
ctagaaaatt aaaggctaatt ttgtgaacaa aaatcaggat ggttttttaga ggtactcaga    240
tgatatatgg agcattgtat actcaggttt atagcttcat cagcttattt tattaacttt    300
tcacatcctg cttggtcatt tccoctgttg tcttgagtat accactatta aataatagga    360
cacaaactac attaaccagt attttaatgc tttttaaaat gtattttaata ggaaatttgt    420
ccnnnnnnnn nnnnnnnnnn nnnnnggctt tgcaaaatgg atatattttc caaattatga    480
gagtatttat atatgcaata tttatcaagg gctataaaaa acatcatttt tttcatccat    540
tatttc                                           546

```

&lt;210&gt; 130

&lt;211&gt; 622

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 130

```

gggctgcac actgttaatt caacctggta ttaacgagga atgaacactc tctgggtgat      60
aatcttaaaa ccagttatta atatacttta cactaaaatt aaaaagacaa aaaaacaaac    120
tttcctaata agatggacac aggacaaaat aaaaagacta aaggacatca cgacggtgaa    180
ctaaatgatt ttgtttgtgg cctgccatac tatctggaaa agaatttaat tttcctgccca    240
tgatttgctc ttcaaaaata cacatctgcc atctgatatt taatgatctc ttgattaaaa    300
tgtcatggct tgaacattca aaggggacct ccagttaaac aaggcagatc aaacacctct    360

```

gctctacctg aaactcctct aaaataaccg taaaaggagc agggagatta aatcgtaaga 420  
 actaagaaga taggagaaac aacattgtga agctagaaaa catgtctctg ccaacagcga 480  
 aaggccaaaa gcaaacagct tcaaactgaa caacctcaga aatgttcagg acgggggacc 540  
 tccaatgttg gtttaagaga ggaaacagag tgcaccggaa acgggaaaat gagtttaaga 600  
 tgccacactg aaaaggggag ac 622

<210> 131

<211> 671

<212> DNA

<213> Homo sapiens

<400> 131

ggggaggaag gaaaagagat ttcacgagat cagatgacag acttgaatca tggaagacac 60  
 atagtcaatt gttttgttct ggtgcattag ttgggggaaag aagaactgag tataagggaa 120  
 gtgaaccaca acaattctga gtccttttct tgaaaaaact aaacataaca aaagtgtttt 180  
 taaagggcat tttcattcct atctaaagta tggataatct ggcactcctg cagtccatgc 240  
 ttttcaagta agcaaccaac caatcttata gttaaagtccg taacatgtac ttagaacaat 300  
 gccaaagcaca gcagagagaa aaactataaa caagaccctg tgcactcaat tagtttataa 360  
 tttagtggg aagcgcaaca gatcattcaa gaataaccta agagagttga gtgcacaatg 420  
 aacatgaaac tatgtggtat gacctggatt agaagtacgt gtacgtatga agctctagag 480  
 ctttcaatga ttttcttttc tgcatagcta caagagaagt cacagaattt ttaaggctga 540  
 attgaaactt taaagatgaa caaggttctt catgaaaaaa aatctcattt ctttatttta 600  
 aagtaaggca taacatatca aatttataga gcccttaaat atattgcaac tgaagactaa 660  
 aaattctcca g 671

<210> 132

<211> 564

<212> DNA

<213> Homo sapiens

<400> 132

gggctgggag gggacgtcca gtccctgccg atctgggaat actggggacc ccaataatcc 60  
 agggagacct gaaggggggt gtcgggcaga gggatgggga ccaggacaac ggctgggcat 120



gagtcacttc ctgggcctaa gggaaggaat gactcaccac tcatttgccc caattcaacc 180  
 ctggaggggc ttccagggga attttggggg ctgttatgag cacagcttca gagggcgggt 240  
 gtttgggggtg cagattggag gtccccggac cactcagcca ctgtgttcaa atttagtacc 300  
 ccttaggtgg gtggaaggca gagatcccca ctcccaoctc cactctcctt ccagctgggt 360  
 taaaccaagg ccgaaacccc ccagoccaaag ccogtactcc ccacttctgt caggattccc 420  
 ctcttctctc tctctggcca caaggcttgg ctagttcctc cctcgccag aaccagttc 480  
 ctctttgcag aacagaccac aaaatgacct ccctggcag gacaggatct aggcagattc 540  
 atctctaact cccaaagccc cagg 564

<210> 133

<211> 636

<212> DNA

<213> Homo sapiens

<400> 133  
 gggcatggtt tctatggcat tctccagagg actaattgtg gtctgttgaa aatgagatca 60  
 ccaagaagaa agggccttag ttaagtcact ttaaaaacag atattattgg tattgatttc 120  
 acttgggggtg ggaattcaaa tgaggcaatg ctccctaagg ggctgtaaca ggatcttgta 180  
 attactgagc tctgggggct gtctgctctc tggggagaga caggctggct ttctgcttag 240  
 tgagaaaggg atttcttttg ggaggcagaa gcaggaagtg tcaggtaacct gctgagtgtg 300  
 cccagagaa ggttttctct tcttattatc tgggtgaaac acatgccaat tcaacccttt 360  
 cagtattggt tgggcagata ctatgtgtga gttattggcc agagagatta gagcagcttg 420  
 cgatgtgggc acccagcctg gcacatagta ggtcctaaga ctggttgtta gaggggttca 480  
 ctgttccaag gtagattcac tttagttggg aaaattaaac agaacacctg tccaacacct 540  
 cttagaaggc gatataaaca gagtgccatc aaaagctaac cggcaaaaag tgcagtttgc 600  
 aagagcatga gatctggagt agaaacctaa agtaga 636

<210> 134

<211> 603

<212> DNA

<213> Homo sapiens

<400> 134  
 gttaaagtct tcctgttaaa aacagaggaa gcatgaactt ctcctgaggt accatttttc 60  
 acccaacaga ttggcaaaaa cgggaaagct gttaacgcta tggccaaggt catctcccat 120  
 ggggtgagtg gaaggggctg ctggtgtgac ttcagggggt tctactggcaa agctgtcaaa 180  
 atgtgaaggg tacacaccct ccaaccatct agaatgttcc accctaggcc accttctgag 240  
 tggatggtag aaggatattt actgaagtcc tgcttgggca aggcaggccg gatttgggtt 300  
 cgaggggtgt ggggcgtgca cgtagccctg ctgtgcagct gtgggaaagg gtgggcagta 360  
 ctgtggggct gacaggagcc atccctggtg tgtgctgttg ggtgacaaaa acagggcaca 420  
 agagcaggct gcccctgccc agacacacat ctgctctctg gaaaccaggc ccctgggagg 480  
 gcagccgcga tgccctggcc caggataact aggtgtgtct gctccctgct ccagccatgt 540  
 ccagtagctg gtaattggtc aacctgccc taacttcctt cgattttttt tttctttttt 600  
 .ttc 603

<210> 135

<211> 583

<212> DNA

<213> Homo sapiens

<400> 135  
 agaggtacag taaaaaggat caagagtgtg ggtggcaggg gatagcagtg cttcacttta 60  
 aaatagtcaa gagtgggcct cacaatttta tttctccaac tcggaaattt cctgtgagct 120  
 ccagacatgc atattcaaca gctcatcaaa ttcaagcagg tccaaaggga atgcataaat 180  
 gcctttgcca tctctctatc ccaaacaat acaataaaca ataacaacca tcctagtcca 240  
 ataaagagaa ataacctcca agaacctgt aaaagccaga ccttgaagct attttagtat 300  
 cttacacgct ctcatcttc cccatatcca attcaaagtc ctgtcaattt aacatcctaa 360  
 atatttctgg catttgtcat ctgtctctat caatagccat caccactgcc accactacta 420  
 cccaaatgca ggctaccatc acctttattt gatcagtctt tattcaactt gccttctcac 480  
 ttccttctc acaatcattc ttacagagc caacaagaat gagattttcc aaacataccc 540  
 ttcaacttgc ttaaaact toatatgctt tcaactgtct tac 583

<210> 136

<211> 480

<212> DNA

<213> Homo sapiens

<400> 136

```
gggaggaaga ttcagtgata ctgacctatc tattccggaa ctgtgtctgt gagctcaggt      60
tgtccatagc ctgctgcaat atgtctaaag attgatcact ataagttttc tcaggttctt      120
ttttcccctt gtcggtctta tatttcatag tccttttagcc ctcaaggggc tagaaggcag      180
tttatgacct ctgctactgc atagatgtaa gactaaaggt tccagataat tgaagttctc      240
ctgacctgaa atgtaaaactc tgtacagtgg ctttgctgta ttctttcaca tccctttgag      300
tctttgaagg tgaggcgggc cacactagct gctgttttcc agatcagggc atgccattgt      360
ttgacctgcc accataaaac agttctacat tcctttgtct gtcttttgag cttaggcctc      420
cagactaacc acatcaggtc tccctagtga tttgtctgcc cccacctggg caagaccaaa      480
```

<210> 137

<211> 655

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 137

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gggggatggt ggaataccat atagtcatta aagagaacga aaaagggtcta cattaaaaaa      60
aatttaacat atatcaagta tgcaaggcat ctgcatacct ttgtacatat atttttgcatt      120
acatttgcag aaccaaatac ataaattatt annnnnnnnn nnnnnnnnng ttagcctata      180
taatttaacc ctatataggt tagccaaata ctgaaatata acgttaagga aatgtttcta      240
agcataaaag ctagatggcc tatgaaatgg actttgtaca aaagaaatgt ggcaactact      300
```

cagtcaacca tcttgcctca aggcaaaaac aaactgctac aaataaaaaa gtggtaacca 360  
atgttttcta aagcaaggaa atagtactac aaatttttca atatttaagc aaatgtcact 420  
ttacatgtgt caataaattt tctatttttag taatttaata actatttctt cattcctagc 480  
tcctattctg ttaaagtgac agtatttctaa gaatcaactg cattacaaag tcactagggt 540  
tctgagtcac ttacagcatc ttatatctt ttacagcata attttaggat actgccttgt 600  
ggatcagct aaacactgaa ttctgccttt gacatacttt aacaaggtag cataa 655

<210> 138

<211> 657

<212> DNA

<213> Homo sapiens

<400> 138  
gggctaagta ccttaccxaa gtacccttag gtaggaacta caaaaccagg atccaaacat 60  
aggtctgtgc gattccccgt catggcttcc actogacaga accccctcat gcaactggttt 120  
tacaacacaa tgaccaccta atctgaaatt gctcttataa atactgtgca aagaagtagg 180  
agctataacc aaactgagta aaatctgcag gcaactctgtt aagtatgata aagtacttag 240  
ggctagatca cctagtttgt aatctcatag cataaatata caaattatac gaatcagttt 300  
tagtttatta ggaaactact ctgaccccaa aatgcaaaat atagcttctt tgcctccttc 360  
atgactgcct gctcactgtg tgactgggat gcagtcacct actgagacta tgatgggtat 420  
gtttctgcta agaaaagctg ccacatttac tttcccata tatggatgct gccattattt 480  
tcctggcatg ctgaatctcc acctcccctc ctcttctccc caccctgtgg cacaagaac 540  
atattgtaca ggaaatatac tctcttcctg caagcaagaa aaatgggttt gagaaacata 600  
tgggggggaa aacaaaccat tccgcattct ctgtttttta aaaatacaac aaaaagt 657

<210> 139

<211> 667

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ( )..( )

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 139

```

gggcattgga aatccagatt atttgaaaga aaagcatata tacaaatagt ctgccaatct    60
cttggcaaat tcatactggg tttatgactc atacttggtg taaagacaga cagagggaact    120
gataaaatag tgatcaccac taaagacatg taatacttat ataacttaaa tgtgcatcta    180
ataatacaaa taagcagttt gagtgattta ataattcaca gagttcaaat gtaattaatc    240
agagaagaac atctaattcta ccatttacag taaatgtctt cctggactat tctctatcaa    300
gtttggcccc aaccactcac tcaaataaac ttactatcat tccttaatct ttctcagcat    360
ggatgtatta ccttgttatt tatgttatgg ctaggatcca atccttttct caaatgtgat    420
actccacatt ctggacaatg taatcagcaa aagtccagac agtttttatt ttaaaaaaaaa    480
agtgtattct ggtagggtag aaccttacta actgattatt ggacttaaat gataacaaca    540
nnnnnnnnnn nnnnntaaga cattctgtaa tctcaagctc tgtatcagaa gatgtattat    600
cattcactct gggcatatgc tgctgttaaa tgcaaaatat cagttttcag gaaccaaga    660
taaagca                                           667

```

<210> 140

<211> 595

<212> DNA

<213> Homo sapiens

<400> 140

```

ggggtagacg aaataactca ttatttttga gacatttttc acaaattctca cttgtacctc    60
tgagtagtaa cttaatgcta ttactatggt tactacaaag caacatgggt ttcagcctat    120
tctttggttt gtctaagaca ctaactgtca gcccaaaaca gcttgtcttc ctatcttccg    180
agttaccaat gattgggagc ccttaattga cagcactgga ctagctgcaa gtgaactgta    240
agttcatatt atctactgaa ttcaagatcc attttgtttg cctgccacac cccacacaga    300
gggtgctgtc ctgtcaggat ttcttggctt cacctcattc ctcttctcct caattctgtc    360
ctgacagctc tatgaagcca gaaaagctca cggagatgca tcttctgctg cgtcctgcta    420

```

actccctggg accgcatacct cacaagctac tttgttcaag aactactccc atttccaatt 480  
aatccaggag gaaaggaaag gaagatggtg attgttcttc ttacaacaca gagctgtgtt 540  
agtatgctga tgtttaatct ttttcagggc agtatattca acttggaagt cagtc 595

<210> 141

<211> 560

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 141  
gggctgagaa ggcaagctca gttgtgcagc gatgtgcagt gctggcccta cacctctgtg 60  
aggggggtttg gcttaggata ggcctctctg ggtgtctgag gaggtgacc tgaaacagag 120  
atggctctggc aacatgaatg gaaaatacca aggatggcat ggagttcacg ttggccgctg 180  
tgcccggccn nnnnnnnnnn nnnnnntaggg gacacatgga aaggcgggaa cctccccaca 240  
acgtgagtgc aattgttcaa ggaccogtgt gatgtcacc acaccctgtc atgtctgtgg 300  
aagccacttc ttccacagcc accaagccat ctgggtcac tgcaacaaga gcaaaactct 360  
gtctcaatta aaaaaaaaaa aaagaatcca aatatttgca tcacagcggg ctgagaaggc 420  
aagctcagtt gtgcagcgat gtgcagtgtc ggccctacac ctctgtgagg gggtttggt 480  
taagataggc ctctctgggt gtctgaggag gctgacctga aacagagatg gtctggcaac 540  
atgaatggaa aataccaagg 560

<210> 142

<211> 409

<212> DNA

<213> Homo sapiens

<400> 142  
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 aaaaatccag ctatgtaact aaattgaatt tgggactaga aagccttcgg cagaccaatc 120  
 cttccagcca tctgatgcgc aacataaggt ttctcataaa acaaagaaaa tgtcaattca 180  
 gttgtgaatt catattgata cctggaactc tcttgctaga ccacctctaa aggcccaggg 240  
 ttcttgggtct ccaattaaga attgtgctga agaatgacta cgacaccctg ttgagatcag 300  
 atccaagcgg agaacgttac gagaaagggg atttcctggg gtctcaaatg tccaacaaac 360  
 tgacaaacac ttcgtggaaa taactctcta acaataatca gggtttcag 409

<210> 143

<211> 422

<212> DNA

<213> Homo sapiens

<400> 143  
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 tctgtgtgtt gtgaccacgc gtggaaagtg acaggggcat gaggcctcac gttgaggtag 120  
 tccacaggct tggtgacgtt gaacttgtcc atgggtggtga tgatgatggc tggagtgggtg 180  
 aggaagaaga ggaggatgaa gaggacgaca ttgatgacca ggcagcgag ccaccagatg 240  
 aagcctcgga tggagagggtg ctcccagtag atgttctgag ggtcaggggc ataggacacg 300  
 gtccagttgg agatgtgcag ggactcgctg caggatgagg ggcgtggctc cccacggcag 360  
 gtgcagccct ggcatttaca cacgttgaag tccttcagga tgatggcggg gattgtctca 420  
 tt 422

<210> 144

<211> 507

<212> DNA

<213> Homo sapiens

<400> 144  
 ggggaggaaa atcacttctt tcaatgggag ccttattttg gggaaaacaa atggaagaaa 60  
 tatgcaagta aaagttcttg tcgcgtctat cacatgtata tgactgtgat gtgctacagc 120

ttgatagctg tcaagaaagg tttttcatat ggagagcttc gtctgcttta ctgacttggt	180
ttagtcctgc ttaagcattt aaaggagca cttggctcag ctcatactca gcttgcttag	240
tgagtaactg ctctatcaaa cacctagggt gttttttacc cttcagattc cataactcat	300
cttaatgcct tccattatca ccatgtgaat ttgcttacca ttagattttt agcaatgggt	360
aagaggtggt aagctagggg gtaatggggg aatattgcta aaaggaaatt gtgttagtag	420
gcgcactgca aagcaacata catttttagca gcaatattaa cctcatcatc tcacaaaaga	480
aagcatatct caactatatt tcttctt	507

&lt;210&gt; 145

&lt;211&gt; 554

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

<400> 145	
gggatgcgtt agaaactgag gaccgaccaa aattaactat tgtagacttt gaacagtttg	60
cagtttggtt aggatcacag ggaaaggagc tggagagaaa cataactat acttattatg	120
gctgtcaaag gacgtgtacg cagtttatat gggtggttg aatgggtagg gacctaag	180
ttaaggagta gtgttaatca agacatattg aaaagatgaa ctaaagcatg ctgtcagagg	240
acaataaggg aaagctaattg tgaataactg gtgtctaggt aagggaatat taaagttggt	300
ttctttttta ttgttagat gtaacttttt catctctaatt ttgtctcact attcattgaa	360
actaagctta atttctgtgt gcagcctaca gtatttctgg gtgaggacca aatagtgagg	420
tccacatcca cttaatatat ttgccaacca ttaaattgcc gctaaagctg cagttgggaa	480
tctgcctgt ttaatatttc agtagagtgg tatttgctta gcccaaaaac catgttgtca	540
attacaaaaa tgct	554

&lt;210&gt; 146

&lt;211&gt; 405

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

<400> 146	
ggggtactgc ctcaaaccac actgggagtg tatgtaaaag actctacatg cactgtacgg	60
cctctctgaa atccaaaaaa attctgattt ctgaaatata tctgatctta atggttttgg	120



ataaggatta cagacttgaa atttcaatta tccaaacatc gacttatccc cactcccat 180  
 cccaccctc aggagcagtc caagaaataa acaaagctaa tattttttac ccttgatcca 240  
 gcagtaaagt tactcacctt aggtaaggga ccaagttgga ggctgcacat agttacocag 300  
 catcaggccc atcaaaggct aactcagaa gctacagtac acagagaaga ggaaggggcc 360  
 ccaaccacct tagaaaggtc ctcaatactt ctggagtcac cagag 405

<210> 147

<211> 567

<212> DNA

<213> Homo sapiens

<400> 147

gggaagaaga caccatatct taccocagac ccaaaaatg ttagggatga gcctgtccgt 60  
 ctgtgacagc cagaagtgtt ggctgccagt ggcccagggg aaccagaacc caggagttca 120  
 gtggaaagaa caacgtaaca ttaataagag ggaccacccc ctctgcagg ttgtcccagc 180  
 aaccaagtct cagctgctgg tgaaggcctg cacaactagg tagttgtcaa agtgacatgg 240  
 gaggtaaatg acaaacactt ggttctaggg gtgggttcca ggatcccttc agggcactag 300  
 gttcctaggt actgtggtaa taagatccca ctcaggccca tgaatgaggt ggattaagcc 360  
 ctttcttcca aggccaactg tgtaatacat aggatccagt agttctgctc tgccacctac 420  
 ctgctcactg acctcaggaa caccctcac ttcacaatat ataatgagt agttctcatt 480  
 ctgtattttg gagaattgtt gtaagattga aaggtcacag atgcaacatg cctaagagta 540  
 ccagacatgc tggaagtcct tgttttg 567

<210> 148

<211> 631

<212> DNA

<213> Homo sapiens

<400> 148

ggggggaatt aaagataggg ataagacact gtaccataa actttacaca atgacaaggt 60  
 attagggcca caggacaggt aaatggagag ctcacatctc actgaaggat agaaagggat 120  
 gcatgaagaa gatggtgctt ttgtgacagg ccttgatata taaaaacat tagcaaacac 180

ctattctcag aaaactagaa aagtgtctgt tgtgctaagt tccacagtgg attcctggac 240  
acgtttatag tacacacaca taacagagcc atgtttactg ctagaatatt attcctagca 300  
cctacttttg aaggactagg acatttgcac agagcagtgt gtcttcctgg tgcctggcc 360  
tctggcccag tttagaact gataccatag agaatgtgag gtaagaacac attcacattc 420  
ccaccatggc tctggttctc cctgtgaagc tacagataac atgaagacta tcctcctttt 480  
ctttcctaatt ccagtcctt taagtatttg aaaacctcaa aatgctttct ctgagactgc 540  
ttattcatag gccaaacagc tcagttcttc taactattct cacatgacat gcttttgact 600  
cctttcatta ttctagtcac ccaatctctt g 631

<210> 149

<211> 688

<212> DNA

<213> Homo sapiens

<400> 149  
gggggagact aaactacctt tatttgctgg acaacagcat ggttgtcaaa actggaccct 60  
ggtttttttt ttccctttca ggacacatac tgtatcatgg gttctttaat ttagtgtatg 120  
gattaggtag ggacatattt gaaagcacta attcactctt gattgccaaa ttcataaagt 180  
gaactgctta aggttagata agaatgatct atttataaaa tctagtgccaa aaaattaaag 240  
taattatact agaagtgtga tttttatttc tgatcttttt aaagtcaagg gatcagtgat 300  
caaacaatta aaatgaagag tccatatctt aaaataacaa attcaatttg taggatattt 360  
tcttttttgt ttacttactg tatttcttgg aattttattt attaagcaat aaaaatggaa 420  
gtgaacacaa ctgcataaaa attttggaa acttctctgt atgttatcat agtcaaaaaga 480  
tgtttttcag aatttgtctt atgatgccaa attattccaa aatttcctaa atggttgata 540  
aacagagtaa gaactggatt atacatcagc tcctgcagtt tccaactgca cattccagtt 600  
ttaaagtata accataatgt atgctttcct cagaagggtg cctggcattt atttatgatg 660  
gtcaattttt ttgttggtg ttgagatg 688

<210> 150

<211> 423

<212> DNA

<213> Homo sapiens

<400> 150  
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 gtattcttca gcaaacaag tatctcatag aatgtaaacg tggatgactg ggggaataca 120  
 attttttttg cgcataatga cttctgtcag tcctctaaga aattcaaaga attttcacgg 180  
 cttccagttt aaattctagc gcctctggcc atggccatgg tttgttctgt gtttgattat 240  
 ctttccgttc aggggttcga ttgttactgg gctactttag acaaagctac ctggatcttg 300  
 agttgccact tttagcccaa aatccccctc ctacctgttt aaggggcagt ggagcacttg 360  
 gtggccacac tggctctctg tgttaagggtg tttgtgaaa attagctgtc tacggtggcc 420  
 tat 423

<210> 151

<211> 617

<212> DNA

<213> Homo sapiens

<400> 151  
 ggggggcaga tgtgtggcgc tatggccttt gttactgtat tcaagctaca atgtcaagaa 60  
 ggtgggaaag accatgtttg gacatgtatt ttttgggagg aaaatgggcc ccgtagttct 120  
 ctgcaaaca cagaatcaag aaaaaagaaa agtcgtcttc tccgcgtggc gttgcctgac 180  
 ccccgacccc tgcgccagct ctctggtttc cccatgacca gctgatggcc acacattaac 240  
 tccctgcctc cctcccagga aagcccaagg tggcagaagg gcagaccctg gcccaactgac 300  
 accccccaca ccagaacag aaccagcat caagcagggtg cacaagaaat gtccactgct 360  
 gaaaccaccg ctccatctca tcccagcacc cgggaatcag tctgtttcct ttccaaattg 420  
 aggctgcttg aaattccgca cctatcccgg gtgtgatacc ttgtgtgttg actccactta 480  
 ccaccagaga tagaagtcta atcattctgc agacaatctc gccagataag gctggcagct 540  
 cgtaaaactt aagtagcttt gtgctgctgc agatggcttc atgcagtttc agacacacag 600  
 tcaggtagga tgggtgac 617

<210> 152

<211> 640

<212> DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 152

```

gggataaagt aacaaggctg gggactgtgt gccgtattcc ctcatcagc ctttccactg      60
tgtaaccoga aagccgcaac gtcgtttccc tccacgcttc tctctgccgc tagtgatttc      120
ctggtctgaa ctgtgactcc ctagtgatgg cctgtaactt tgggttctgt gatcatctga      180
agtctatcaa cctctatata gtcagggaaa ccagaagag ggaagaggga agatttctgt      240
ttgattttca cacaagcaag acttactaaa gagttaggca gaattgttca cttagccttc      300
aattcaaaat tgaatctcag gttgaaactt tggggatatgt ggggttgttt tgttttttga      360
aaaatgtacc ctttttgagg ccaaataaaa aggaactaga cagtctctgtg tcagagcctt      420
tcagactggg ggtggaattt ggtagctcc atttagcggg ttaatgttga tttaaactct      480
gctgtgtgca tcaccaccct gagctgtgtg gcagctgagc acttccctgg gaagcaaata      540
taggttctgt ctctcaagg aacttttgat ctcttggggg aatccaggac aagcctaaat      600
acaaccatac aaagacctac ttacacagct gacactacag      640

```

&lt;210&gt; 153

&lt;211&gt; 592

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 153

```

gggaaattga tatttaaaag agaaggaggg tgattgaggg gaagcccaa ggaccgctt      60
gaggtttgtg ataatgaatt caaagagaaa caggctagca tgggaatgtg acattttcca      120
gctatgcagg catgagaggt ggagaagcgg atttacttgt agattcgcca aatgagtaag      180
acaaagcaag aaaggggtaa gtgatgaggg gacatgcaag gtagtgaaaa ctatgtttaa      240
ctgtggagta taagcttggc caggaaagca ggatggccaa cagtagcttg agggacagtg      300
aaaagggtgtg atgggccaga gattgataaa agaactaaat atttgtcttc gtagtggaag      360
agcaacagat aatacctaaa actgaaaata aatcactaaa tggcagcatg agcatgttat      420
tgaaaaatgt gaatgcaaat acaaaacaaa taagacaaaa agttgaaagt tgtttctctg      480
gatcacggga aattagtaag gcttatagag ctgattgacc ttttaaaaaa ctatgtgcat      540
atataacttt agtaaaaatg aaacaaagaa taacagtatt ctctagttag gg      592

```

&lt;210&gt; 154

&lt;211&gt; 662

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 154

```

gggcagggtgg gcctgtgaac aaaccctcct gaggatatga tcagggttgta aatggaaccg      60
taacttttttg ggtaatgtga gtcagccctt aagcctatgt taaccaccga aaagagaatt      120
aacctttggg gctttgcaag gctccagctg gtgtcataaa gtagtaacaa aaaactgctc      180
ttcagtagct tgagggaaaa tctttgaaaa atacctccct gggagcagct tccccatctc      240
aaaagatgta gcatagtgtt tttacaacac ctgcctgca caattttcta agtggagtgt      300
cagtattaag gccagacctc agcccaggac cgctctccac tgagctcaga gctgtgcagt      360
ctgagccctt caaaaacatc aactggattc tgccagcaga aacagttctt gatcattgtt      420
ccctgttatac tgtggcaaag ttctgactat tcatgatcat aagctgaata tgagaagaga      480
tccagtatac aaatgttttg cccatgtgaa aataagagct cagggtgctt taatcaattt      540
taaattattg cagagaaaga aagcaggtaa atactttcat gagagagctt tttgtcaaag      600
gttctcacgt ctttcctcaa gctactctta acaaagtact gtatgtgaca aaattaagtt      660
ta                                                                                   662

```

&lt;210&gt; 155

&lt;211&gt; 514

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 155

```

ggggtgatgc aaagggcttg gggcccaggc cagaggggct ggggtgtctcc atggacgtgt      60
tcttaggggtg ctacactggg agaccagaa gaaggagata acacgtaagg gtgaggctgg      120
tccttggaatc tcagctgaca tctgcaaat gtggagccct gaggtggagc caagcccagag      180
gcacagccca ctcagtggca caagccacaa agggccggcc tcacccaac ctgggtgctc      240
gtgattgaca gcctcttgtt acgtgagga agcagcacc cttccgtggc agaaaagttg      300
ggcctgaatt gtttgagcaa ttccacgtgt gcagctgcgt ataccatcca gggatgatag      360
accatgagcc cgaggccctg atgtcctggg gtctagtcct gtgtccacag gcaccactcc      420

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cctttgtacc tctgtccca acagccaagc tccacagggc caagactaca gcatcctttg 480  
 ctcagcacc aaaccacagc tgtgcccaca gcac 514

<210> 156

<211> 490

<212> DNA

<213> Homo sapiens

<400> 156  
 gggaatataa acaaaaaaga aagaagcccc tcttaccaaa taatgtctgc ctggatgtgc 60  
 taaatagttt aacaccattt actatatatt taaagggaag gaagcaacaa tgatggcatt 120  
 acgataaaga aaagcaaaca gaaagccaac caggggctgt cttgctgagt agatttcaat 180  
 ttcttaaacc tatccaaaca ctttagtatg ttgtttatgc caaatgaaca catttataca 240  
 ttgaaaatt tgggaacata tttagtaagt gataggaacc aatgggtaac cactgttact 300  
 tggcagaata tgacggatta atcaagagaa agtcatccac tgggaagtag agtttgagat 360  
 aaaatttggc tctatagaac tagtgttggc ttcttcagtt tcctaggctg acagagaatt 420  
 gtgaacttac ctacagggt atcatagtgg gctttaattt tctgtatgt ctaagtaata 480  
 ttgcaacgaa 490

<210> 157

<211> 458

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 157  
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atactgaaaa aacaaaagaa tttagtatcc catttaatca gacctctata ttcactggta 120  
 actatgatag ccacatgcaa atacagtcaa gtatattaat gtaatccaaa gtgctaccat 180  
 gcattcaaaa agtcagaaaa ttattcatcg caaaacagaa ttaagaactg cacatagcaa 240  
 ctgattttta aaaagagttt gcgtcgtcct ccttcctttt nnnnnnnnnn nnnnnnnnnn 300  
 nnnnnnnnnn nnnnnnnnta ttttcaaag aagatgaact gccaatgatt taaaatacta 360  
 aagaaaacag gacaaggctt ccctggcaat ctatttacta aaattcatta acatgcaaaa 420  
 tatccattca cctacatgta atatataata tgaatatt 458

<210> 158

<211> 474

<212> DNA

<213> Homo sapiens

<400> 158

gggaacttga gaaatggggg ctctccctgc accgagacag cgcaagtgggt gcttggctga 60  
 taataacacc tgtaaagagg ccgcaagata gagacttcag tgagatgcgt ttctgtccaa 120  
 gttcgtcaga gccacctggg caatgatctt gagtcagtgt ctctttggtg gttttagcac 180  
 attccaggac caccaatact accatttact atttttcttt aacactcagc totcaagttt 240  
 tgaagtctgt tcttcgttaa acgtgagagg tcaggagtgt tatagagggg ttaaagatac 300  
 cttaacaccc acgagagact ttctcctcag cctactggga aggcctaaaa aagaactgga 360  
 aaaaaaaaaa gaggattctg ctttggcaga tccagtggta gcagatccac gtgttgggaa 420  
 atgcttttga gctggggaac aaagctgggg aaatagatct ttaagaaagg gagc 474

<210> 159

<211> 484

<212> DNA

<213> Homo sapiens

<400> 159

ggggtttccg ttctgtgctg ctttgctcgc tgccctggcg aaccggaaag atccaaggtg 60  
 tttgttcacg aaaacatacg cgaacttggt ttgggagaaa tgggggctgt taatttttca 120  
 tgcttccgtt actaccaagg gtttttttca ttttcttttg taccttcttg tgtctctctc 180

ttggagtggt tgtttttgaa tcatggcgat ttttaatttgt ctttccttac cctcacatta	240
atccctaggt agaattcgct gctgtagtgt ttcagaccga cgctaggggt gtgtctcccg	300
cctctgtcgc tgcagccaag aaatcaacga cgcctttta gcctgttacc ttaccggttc	360
tctcgctcgg ggaagcccta gtcgttagtt tcctctttgt aatcaagagt tgtatacaca	420
gtagagaaag ttcagagtgc tattccgcgt atatcagata ctccatcatg cgattcagtt	480
atta	484

&lt;210&gt; 160

&lt;211&gt; 594

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

<400> 160	
aatattttta aagagaaatg atttcccatc taaaattctg cctgccattc tatcatttaa	60
gagtgaggag ttgtgtttca ggcattgatg agtagacata ctttttccta ttctctccac	120
aaagtatagc tgaaaattgt gttatatata aaccaagcac aacgagctgc tgaaaagtga	180
ggagaaaaag gcacattgtc taggacctcg ggaccccgagg aatggcacgg cagtcagttc	240
cctggatttg cttttttcct tgtgtgtccc ggacagggcg ctggagaagc tgataacatg	300
gaaatgcaaa agagcagaga caaaaaaag tcccaagaaa agcctactct gtctagccca	360
agaaccaaga gaaaggggtg gcttggcatg acgaaaatcc tgtagacaat aattgctata	420
ctccagtga aacgtcacaga aacaactgcg gccttggcaa aggctgagaa gagtctagac	480
ttaccgggcc aggttgtaat gagagacctc aatctctccc ccatcccact actcatgtgg	540
tatcatcaga ggccaaccgg gaacctggcc ttcactgatc acctggcagt aaca	594

&lt;210&gt; 161

&lt;211&gt; 699

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

<400> 161	
ctttagtgt ctgaatgttt acctgatgtc taggcaacca aaaatcagga ctatgctaga	60
atgttacatt taccaacata tccttgacct aaagtactaa gcatattaca ccagtgtgtg	120
tggcttcaaa tacaagactc tctatctcta ggtattgaaa tggcgaataa gaattgcagc	180



tctgaaaata taatataaac acatTTTTca gatagcatta tacaaataaa aatactTTTg 240  
gatactagaa TTTggggTTa gagctgactt caataagggg aggaaaaaat atgtgcaaag 300  
ggaagggagc tcaatttTga ataatatatt tcaaagtatg TggcttTgca tttttaaaat 360  
gctaaccaaa aaaaatgtga gatagagtga cccaaggaa ctttttacag ccagcctctg 420  
gataccagat atagcattta caacttctga tatgctagac aaattttcca tagttttaat 480  
tttcttaaag acatatagtg agtgaacacc aacactggga aggaggtagt gttaatttga 540  
tcaaattatg atatttccc actgattcag aaagggcttg ctctttctat aggatatctc 600  
aaaacccttc caatttttat gctacaagct ttactctatg aaggatacta ctatgtatga 660  
gattcctcag aagctagatc tcacaaacat atacaaacc 699

<210> 162

<211> 522

<212> DNA

<213> Homo sapiens

<400> 162  
gttcagaaga aaaatatata aatccaaaga agggaaattt taaacattgg gtggaagttt 60  
cagtggaaat aatggtactt gagttggact Tggatgaaca ggatgtacac aaagaggcca 120  
actaagagct gtagagcaat gacttaaaaa aagtaatgat gggagagctt ctactttcat 180  
ttaaatcatt tctcagaatg aaaacacgcc aacattcaaa tttcagtttt ccagaaattg 240  
tgaacatgga ttaccaaagT ttgataatca tttttaaaga agagataact ttaaaaatct 300  
gcttccaaag attcaataca ggtaatttca acatcagtaa tacattattc ccacatatgc 360  
tgtcagtaaa aaagtaatct gatottaggt aatgcaagtg cctgattaga gagtattccc 420  
aattcctcct tctcatccct tctaaccattc ctgtaattca tttcgctcat ccataagcta 480  
taactactga acagattggt gccattatca gcaacaatca gg 522

<210> 163

<211> 473

<212> DNA

<213> Homo sapiens

<400> 163

```

ggtgggggtgg ggggaaggga aagagagact gactccagaa aaaaactcaa atatatacat    60
acggaagcac ctcaaacag tgtgggaaga aaggattatt aaatatatgg ttattatgtc    120
aggtaaataa tttgaggaaa aacttagatc caggcctcac atttcaccac aaagtaaadc    180
acacaggaat tactaatata actgtttaaa atgaaaccca aaagtactaa aagaaaaata    240
taattgaaaa attatcttga aaaatatgac attaaagcag aaatttaaaa aaaggaaaga    300
ttatacttca taaaaattaa ttacataca tgttaaagca ctacaaagtt aagataaaact    360
atgaataagg aaaaaaggta ttatcgtaa catataagtt cttaaacttc aatacaaaac    420
ttgataaaca attcagaaaa aaataatcac tacatttacc aaaatatgtt aaa          473

```

<210> 164

<211> 510

<212> DNA

<213> Homo sapiens

<400> 164

```

ggacagtaat tctctgaaga atatgtagca gtttttgatt atgtcctgat caaaggataa    60
ggtagtcggg ttgggtaagg aaatacagag taggtccag gtcaccatgg tccaagccca    120
ggtgctcagt gtgtgtcctc tctctgcccc ccagttctac ccggtccatc attcaccacc    180
tgctctgtgc tctcgaaggc tgacccttga gaacagcatc agaggccttc ctgcacctct    240
ggcttcttgc tggtttggtc aatggcaggc agcagtggga tactgggggg ctggaggaaa    300
gcagtgccag ggtactccct ccttggtccc ttccctgtca actgctgtgg gtgacctgaa    360
tcctctcaa ggccacactt ttggcaggct gccctcttca taaaactacc ctcccaattt    420
cttgtaacca ctccctctct ctaccctctg aagcctgtaa tggctcccgg acgtcattag    480
tgctgggaca ctgcactgtc ctttggtggt          510

```

<210> 165

<211> 490

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 165

```

cttctgtaga aatcaacaaa aataccctat ctaatccatt tttgcttcca ttataaat 60
tcctaataata gttttttttg gcgggtggga aggcat ttga cnnnnnnnnn nnnnnnnnnn 120
nnnnnnnnnn nnnnnnnnnn nnnnnnnnt ctaatatagt tttgccctg aaatgaaat 180
ggaagtgatg ttttggttcc tctcaggcat tcagcaggga gggcttcgtc ttaattccat 240
ttgtacaga ttgcatctgg gccatttgcc agaggatatt ataaccctgg cagatcgga 300
cccaacactc ggttcttggg tttccgaac tcggtgccac tctgcaogtc atggttcatt 360
tggaatgcc ctgatgccct acatgcaagc ctttgtgggc gtctgtagga cgctgtactg 420
gtctgcaact gctaccacat cttaagctt tctcctgtct catgtat ttt cttcatttcc 480
catttgaat 490

```

<210> 166

<211> 549

<212> DNA

<213> Homo sapiens

<400> 166

```

gtaattgaaa atgtcatctt gcctctccct gtccccaaaa cactgagcga gtaaaagcta 60
agcctccctt tctaacattt ccaaaagcct tgcatgtccc tggaacaga tggtcagagt 120
gattacacac tcaccttggg aagagggtag agatgacaca atggttggcc agtgttctgt 180
ttacaaaact ccagagtgtg acataccaca tcagcattca tatctgcgct aagcctggag 240
ggaaacgggtg caaaacaaag gctattcaga tctcttaggc attaggaaac agaagctact 300
gcaaagaaag gtaaatcccc agaattgatt ctaataccct caactccttg cagagtggcc 360
tttgacccca atcccgggga gctgctggat ggtaatgatt tcttgccact gttgctctct 420
cctgcattta gaatgaggtc ctaaaggcga ggatggggca tgcacagcac tgagctgcca 480
gtcagcctct cagcgagtg ctgggattct tttcaggcaa agccacacat aaaattggga 540
aagaaaaag 549

```

&lt;210&gt; 167

&lt;211&gt; 402

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 167

```

gggctacaag atcaatacac aaaaaccaac tgtatTTTTT atattctaataacagaacat      60
aactcacta taagtcctgg caattccact ctttgatgga ataccccaaa ataggggtta      120
cacagaatga ggaaagcaaa gtaatacaat caggggtgtag cacataggga acatctatga      180
tactaacaat gttgcatttt tttctttaat agccaactca ggcagttaga aatatggagt      240
tagtgacaat ggtttctcct ctcttctatt atcttctatt tgctcatctt ccagtgtttc      300
aacttcagtc ctgagactct cctatccaaa gctcatccct tacctgaatc aatactgagg      360
acatcatcat cttcatcagg aatctcaatt atttctgtag gc                          402

```

&lt;210&gt; 168

&lt;211&gt; 555

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 168

```

gggatgtaaa agtggcagag ttTggTTTTt ttttaaagtt aataaagctc acattggttt      60
tcaagttcaa gattaaaata tgtgctattg atgggTTTTg gctctccagg aggcttcttc      120
tgggctaacc agatacaaat gagtttgata gttaagtttc tctggcttat ttttattatc      180
ataagtaaag ttTggaaatt tggtcattga gtggagaaat atagagaaaag aaaggaaacag      240
ttttctcttt ttctcccat ttctgggtgTg aacaaatgtt aagaaatatt taccactaat      300
catttttcta gtgctactgc acggagcatt gttctgttaa aacaaacaaa aattcccacc      360
atcccagtct Tgttttggtg aagttcaggg gagtaagtat tatttgTTTT tctgtaaaag      420
acaacattgt agagataggc atgagtttgt tttttaaaaa ttgttagtgg tagtagtatt      480
aagccactgt ggtctctttg agtgttgtag agagcatatt aatgagaaat tgagtctttg      540
aaatagaaat gtaat

```

555

&lt;210&gt; 169

&lt;211&gt; 543

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 169

```

ggggccagct ccatacagca gtgcaggaca ggcagggcgc ccagccaggt gtacgtcctt.   60
gtgtccatgc atctttggca caggttcacc aggtacagcc gccagctctg aggtatccca   120
aggatgtggc ttaggtcacg gtgaaactca tctggtgagc tggcatctga ggtaggagg   180
tgacacaacc agtccaggct gccttctaataaaaagctcaa tttttttcac tacaaaaagg   240
acaatcaggc ctgttttcag tttactcctc actgggcagt ccacaggcaa aaagtcctgt   300
ctttttccgt ccggcaatgg taccacgtgt tttttcagat gttgccacag gtatctcttc   360
acctctttct ccctgtactg caaatcggtc cacagctgtg cctgtccttc ataaatcata   420
ggctgttgca ggacaaagca aaactgctcg aactgggtga agaagctgtt cagggttgatg   480
gtgtcccagg tctgcaggat gctgaagggt ctgtccagca tgagcgcagc ggcaatctgc   540
ttc                                                                    543

```

&lt;210&gt; 170

&lt;211&gt; 601

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; ()..()

&lt;223&gt; "n" is a single nucleotide whose identity could not unambiguously

&lt;400&gt; 170

```

gggtatcaga gaaaggagtt tctgcagttc aagactgagg acaatatattt acaaaattgt   60
acatctctgc tgtcaagaaa gacaatttat aaaggctctga gtcattgttg ctattatttc   120
acttctcata tttctgaaat tttcaggaaa aaaaagtaga aaaaaaactg cacctcaatc   180

```

```

tgtctgtaag tttctattac ttacttccca gatcttcaat ttgaggagat gtcccccatc 240
ttactgagac tctccagcca tattcacaaa cgtttctcag cttttgattt ctttttcagt 300
gtcagnnnnn nnnnnnnnnn nnnnnnnnca cttggatata attatagaac agaatataga 360
caatatgaat aacaaaaaac caaatgttaa aaaaagagga tccattttca taacttagtg 420
cagttgagac ttaagttggt ttcacatagg atggaattaa gaggaactg ggttttctca 480
gtacaacttt ggttccctca agatcatgta aaagctagat ggtccccaca gaattcagaa 540
agctttcgga tatgcatggt ctaataaatg tctttacatt ttgatggac cctggcgctt 600
c 601

```

&lt;210&gt; 171

&lt;211&gt; 696

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

```

<400> 171
gggaaaccag acacactgac aggagcagtc actgttcagg gtgcacatac agctggctaa 60
gagaatcctc acccagtgtt gacagatctt tagatttcac caaataaatt agaaatgcag 120
atTTTTatgt aaaaattcca gaactttaaa tgttggaac taattacaat gaaaatgctg 180
tactggtcag tcaactgccag accaattgac aagtcttcag gccagggtaca gctggcaggc 240
tcctaccgta taagcctaata tttactgaaa caatgtgatg ctgcaatgag ttagacacag 300
aatgaacaa caacaaaaat acaagaaaag gtaacatttc atatctatta gtactgttag 360
aattactgaa aagatatcaa gaaaattaat ggatttgaaa aagggccaat aaaatccaga 420
tatatcaaaa attaaagaaa ttaaggatat cagagatagc actgtgaata tgatctgccc 480
ctccaatata aacaaaggca agttctaaaa acaaaagaac atctcatgaa aaagtactta 540
tataccaaag agcactaata tttttaagaa aaaaatgaaa attctaaaag aaatggtcag 600
taaacaatct tagaaagatt aaaacaaaa aatattcgac aaaaataaat ttttaatcag 660
atacttgggtt agaattttta aaagtgttca cacata 696

```

&lt;210&gt; 172

&lt;211&gt; 413

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

<400> 172  
 gggtaaagaa gcagtggctc ccaggggccg tccatgttct ttgcccactc tgagagtagg 60  
 cacctcctta catcatgtgt cctagatgcc ttgcttgcoo caccctagtc ccagccctga 120  
 ttttcatttt caaaaaaaaa tcagaattat tcttaaccaa tggtatctat tgactattat 180  
 gaggacatga tcctctgaac aatcaagtga ataaatcaat cctgtttcat caggtaaagt 240  
 ttcaagtga tggccaagca tttctagggg gtcacaccag ctgttttctt tccatatatg 300  
 caatttgagg aggcctttgc atgtgtatat atgatgtaag ttggtagtaa atggtttctt 360  
 agaaaatgat taataacatt agatttgttt tactaagctt taatttttac ttt 413

<210> 173

<211> 512

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 173  
 ggggaatttg aaagtagtat tcattggaaa gagactccaa gaaaatactc gaagacatca 60  
 aaagctggat tcgaggggat aacgtgtttt gtttgtttt ttaaattaga aaaataagga 120  
 attgcagtgt gatcttcttt ccccttttaa cttagaggaa cgaggattat acagaaattt 180  
 gaagtaagtg aaaaatcttc ctataaatct aaatgcagta ggtnnnnnnn nnnnnnnnn 240  
 nnnnnnnnnn nnnnnnaagt gccatctgtc tgagcatggt tcctgaggat ttgttgactt 300  
 cagtcattgg aaaattcctg ccagcgtttg ccagttactg cagccattcc tgtagatacc 360  
 cttgggcata tttcttgggt tgagaaggat tgtacttttt ttttttttta aaggatttac 420  
 tttatggtag agaaaggttt aatactaaca atttgattaa tataacttag tacattctgt 480  
 ctaaatgtta gcacttaaag tcttggaatt aa 512

<210> 174

<211> 583

<212> DNA

<213> Homo sapiens

<400> 174

```
gggctcgggc agcccaggcc atgacccgaa acaatgaact acgtgagtaa ctgcagacat    60
gatgtgtgga gtggtcaggg aagtgcagaa attggtggat cctcctgaaa gcagacctaa    120
tgactaacag cccaggggtgc taccaaagag ctattcatat gagaatttca aatcccaaga    180
gtgatcagaa agtaaacaga aaactcccc tgcccaaat atggaccagt agagaggtag    240
aaaggatgcc agagataatc atacttgttt agaggtatcg taattttatt tgtggtgtgg    300
tttcttgttt tgttttgttt atgtgggatg ggcctgtaag gtggcctaag aactaccaa    360
tttatgagtt tggctaaggg actggaaagg agaagagtgc ctttgcagaa agcaggagct    420
ggaacaaaca cttatgttta atattgctcc ttacagggtc gccagcaaaa gaagagataa    480
cactgcattt ccctttacca actagcgtcg ggagcactgg acacttaaat cctcatctgt    540
cctcctttcc tgtaaataaa agcccttcta tccataaaca aaa                        583
```

<210> 175

<211> 478

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 175

```
aagaagaggt cttaacact tactctcaat tcatgtactt atctcatgat aggtggaag    60
caaacaaacc tccctcttct gtggctgcag tattttctcat tggacagacn nnnnnnnnnn    120
```



nnnnnnnnnn nncatgcttt gttaatgtta acatactact gctgctttta acatttcatg 180  
aatttctgga acattctatg ggagtaacat aaaatgttct atactattta actacaagca 240  
aaaatagagt atgaagcttt tcagaatgac aactgtcaca attatgaact aaaactcaga 300  
gagggtcacc cattagtttc cttggttaca tccattgtaa aagaagcaag atcaaatgca 360  
ctggatcaga cacacaagtc ctacaataag tgtccctgaa ataacctaaa tataattgta 420  
aatataaaag aaaaacaaaa ctccacattt aaaatattca agataaagag aattcgga 478

<210> 176

<211> 629

<212> DNA

<213> Homo sapiens

<400> 176

gggacgtgga agatgactgg taaaggtaac tgggtcacgt gtaggttttg taaggaaaag 60  
cactgtagac agtccaggca gacaggcagg gctaccagg gagcagagac aatggagcag 120  
tgcaaggctg cctgggaacc tggctatcca gagcgacgcc ctgtctagaa ctcccaccag 180  
ttccaccgtg agcagaggag atttatgcaa gaaaaagcaa aaaaatttac caactttggg 240  
cacatcctat ttgactcctt atgtcagact gttctacccc ccaagaaatc tgagaattgg 300  
cattgtaaaa aaacacttca aaacattacc tgatactatg agaaaactaa gtgctgacaa 360  
atcttatttc caggtggtga atattgttca acccacatat gataatacta ataatacata 420  
aaaattttac caataatata atggctatgc aattttttaa aattccttga tttaaaaata 480  
aagttgaaag catcatgcc gaagacagta aaagagttac tagtcttcaa aactgacaaa 540  
caaggaagat attaacaagt accaggaaaa tcaaaacagc attgttctact tctaaaaagg 600  
aaaaataaat tatactaaaa ttattaagc 629

<210> 177

<211> 547

<212> DNA

<213> Homo sapiens

<400> 177

ggggagtctt caaatggctt caatacacca ttgaagtaag aaatggcctt cagtttccaa 60

```

ttttatggct atatgggacc atgctgtcca accccaaata gtcaaaatct agtaagacca    120
aatttaatat agtacacca aagaaaatta ggaaaactta aaaataagcc agataatatt    180
cagtgatagg acaccttttg ttttaacatt accgtgttaa acatctatcc ctctattgtg    240
ggatatgtc cttgctctca cactactctg tgtttctcga ggtaagacag ctagtatttt    300
attcctgaat agtgcctaca ctgagaatth atagaaagga cagcaaaatt atttgaaaca    360
tgaaaaatgt tttaaaatga aaatagtaat tcaccataac aagttctatc acagttaata    420
taaattgagc accccaatct aaaaattcaa aatccagaat gttccaaaat ctgcagtttt    480
tggagcagtg acataacgcc atgagcagaa gattccacac ttgatctcat atgacaagtc    540
acagtca                                           547

```

&lt;210&gt; 178

&lt;211&gt; 675

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

```

<400> 178
gggtgttcac acatttgagg actgaatgcc aggagccata ttgaaaaaat catttgatac    60
tggagctgaa agccacactt gttactcaac actcccatta tgctgaaaaa caaacaacaa    120
aaaaaacac atttacaaaa catttagaaa gaagaaataa gcaattattc tctttttgca    180
ctaattggaac aggtctctct gaattatgtc ctgtttcttt tctgccagca ataacaagca    240
gctagattgc tactcacaga gaaccatttc cagtacagct ccacttaacc ctctctccaa    300
aagtcacagg atctcaggaa gcaggagctc ctgctgtgcg gcaagaagaa agggaacaaa    360
gacttgtaat atggcaacgg gaatggaaag agcaatcgga cagacaatag agccaaatgt    420
tacatggaga ttttgagtct gggcaaccaa taagaccacc gatagcttta aaataaagga    480
aacagagaaa agaagggaag cgcttggtga aaacctgtga tgggttcaaa tttgacatag    540
ccaattactg aattcggggg tcaggaaaaa cctcagtttg atcaagagat caaaaacctc    600
agtttgatca aatttctagt ttgatctctt actttactga taaggaaact aggaaaatga    660
catggacatg aagga                                           675

```

&lt;210&gt; 179

&lt;211&gt; 684

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 179

```

gggaagagct gaaattaaag tcagacagga aaatacagga tatttgactg gtattttccc      60
agattccaca ccaggctgta gccactgggg aagaaggggg ataactggag attgggcaaa      120
tttggaaacct caagagatgg caaagatcag aatcaaccaa agccttcttt taaaattgca      180
tttccttgta tttttaagt aacttaagac tgtgttctgc atgttctcac tgaccacata      240
aaaccttgag agatcagagc tgcagaccag cagccctgta aattcactgc tgattgtaag      300
caaaagcagc tagctgactc tattactgta gttacagaaa tatctttaca aataatgcag      360
tgcagaacaa taagacaaat gatgccaaga ataaagggcc cctccttgaa accagagggc      420
ctctgcaggc ccaaagagga cagaaggcaa ttaagactta ggtgttgggg ggaatggaga      480
gaggttttct tattttctt ttctgccatt gctaattttt ttaatgtgta tgcctgaggg      540
tgagaatcag gagatztatg cattaggtgg atgccctcct ttgcaaatg gacaaaagag      600
tcagcttgcg gagcagatta gatggaagag gccaaagagc ccaggggctt caagctccaa      660
ccaaatggga aagcaatgag tggg                                           684

```

&lt;210&gt; 180

&lt;211&gt; 532

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 180

```

gggtgatagt agccaccaga tgcaaatgc ctcaaatttt agtcaccaca tggaagagaa      60
gaagcctctg acctggaaca cctagcctgg tctatagatg aacaagaaat aaacttctgt      120
tatgtttgaa cattacagat ttggttctgt tatagcaagt tagcttacc tgactaaact      180
gttgctgtc tcttggagg tgtgccctcc ttccctgaaa gtgacttttt catacatgta      240
atttatattt taatccatat tctccgaagc atatccacat ctattcaact gtttccatgt      300
tttccacca cagaaacctc atataaataa atatatatga aggtttattg cattattcaa      360
ggttctttta aattttattg aagtatagca tatataccga aatgtgcaca aaaaatatac      420
actatctata tacacattat aaataacaca tatatctgca gaaatttaca atgctatcta      480
catctggggc attcccttcc tttctacttt ttctcatttg ctattttttc ag              532

```

<210> 181

<211> 572

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 181

```
ggggagcggg ggccaaagct gtgtggagga ttgcgtggtt gtttagtttc aggtaagcca      60
gtattcctag gaccaagttc atagcccctt ctcatcctg tttttcctga ctctgcctgt      120
ctatggattt ttcattgtcaa cttgccccaa gtgcaaaggg tagttgcctt gaccactta      180
accagggggc tcagagagac actccaccgg gctcaaggct ggggtctggt atccaccttt      240
ccactccann nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nncagtgtat aagaatggct      300
gtaacaaaaa ccagccatt atccagaact tgacctctga gaactcatgg cctagaaaat      360
aaatacttgt gatgtcatgt gaaaagatgc aatggtaa atgtgcaaga gaaaggaaag      420
aacagagaaa gtaaacctaa ctaagcctgg tctccctagc agcatgggtg ataagcagac      480
atttttatca tcaacatcat aattccaact gcctgccttt cccatagcca tgagagtgtg      540
gattaacagg gcaacagggt gtgctttggg ag                                  572
```

<210> 182

<211> 547

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 182

```

ggggcaggga aacaataaca ttttctcagg taacaaacaa accccacagc ttctttcata    60
tacataaaat aatttactaa acaatttaac ataatagaaa aaggtcatac ttcattaaca    120
gcaccaaatt tgaacatgtg atgttgtaag tctaaagagt tctttgatct aacctttggt    180
ggttnnnnnn nnnnnnnnnn nnnnnnnnnn agaggaggag tagtagattt ctcctctagt    240
tcttctaagt tcttctcctc cacttggtgt ttcagctctt cagtctttgt ttcagatct    300
ggctcagggt caggttcatt agaggattct tccaaaggct cctctatgcc attactacaa    360
taaaatattt agttcacttt ttagtaggag ttcaagtaag aaaaaattca atttctctct    420
aatccaatgg gtgtaactag ttatatgcca ataacttgtt ctagatctac aaagtattca    480
aagcaaaatt ccaaaaagag ctattagaca gaaggaataa tactctcaag tagcagttct    540
ttaatcc                                           547

```

<210> 183

<211> 525

<212> DNA

<213> Homo sapiens

<400> 183

```

ggggtgaagg tgggtgttga gacagttaca gagcttaatg ctttttgctt gtcagtagta    60
ttcttaatcc acagtaggat gaccactgt tcttcagtg aaagtttaat gaaatatgtg    120
tcaataagcc atcttttctt ttaacaatt agattgttat agaaaaataa gtgaagacta    180
aaagtcccag aaaacagaca catcctttct actacataag ctcagtcaaa gacattatca    240
tgctacagct agcgggttta aatattaacc acttaggaaa aaaaccaacc atatagggca    300
atattaggat tttctgtgaa tgaacaatta aaaaaatgca aactctagaa ataaagcagc    360
acacaaaagt tacatactaa cagtatcctt tgggtatttg catttttgct ctctacttta    420
aacttttagg aaggaaacaa gacatattaa aggactgtgc ggcttcagaa aagagtgggt    480
taagagcctt agaagatatg aaaatagttt acacaccaa gatag                                           525

```

&lt;210&gt; 184

&lt;211&gt; 733

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 184

```

gggttggtgc tttttaaggt tataccttta acaaagctgg aggttttttc tggagacagt   60
aatagatagc aagtgtctctt ttctttaatt ttctatgat attggctaga aaatggagtt   120
ttgcaaactc gatccacgtt ttagtttagc catctttgct ctgctacctc tctgccatca   180
tctactaagg gatataaaat ttcccaaatt tttctttttt taaagacagt tataaaaagag   240
ttttaagtc gcataatagt gctcttcaaa tacttgatga actgccagag tacaaaagga   300
ttaggtttac tcataggacc ccaaaggata aaattaggac taacggggaa agagacctaa   360
caaagcacca aaacctagaa gctggactaa actgacttgg aaaagaaaaa acctatgtaa   420
gcatgaatga gagaattact tgataatggt actgaaatat ccatgcaactg tatgattatt   480
tggtactaat ggcttcaag gtcccattta accttgagat tccatgagtt tctgataata   540
aaccttaata catgtcattt aatattgatt ccacttaaaa gggaacatgt tatgagatta   600
gggaagtcac caatcacaca atgtgacttc aaaaaatta gaaacttctc tgtataaaaa   660
tgagaaaatc tcaaatgttt agaaaccaa aaaatgagaa tgaaatcaga tgtgaaacag   720
atttctattt gca                                                    733

```

&lt;210&gt; 185

&lt;211&gt; 553

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 185

```

ggggatatcc caagatgagg aaggtgaagg acctgaggca gaggccaggg cctgggtggag   60
gctcaacaaa tagtcgtttg ttcccctgaa tgatgagaca ttttccaggt ggacaagagg   120
ggaattaggt gtgtagagac aaaggagata aagctgcaca tctgggtgac ggtagtgaag   180
gcaggataga gaaaagcagc ctagtggcaa ctttttcaca ggcatggatt tgtctacatt   240
aaaatcagtt tcttgaaaca tcatttttgg aaatgccttc acagaatgaa acacaagtg   300
attactggtg tacacaactc caacatatag aaaggtgtcc cctcccatg ccaaccctg   360

```

ccacaaatgg ctgccagact ccctaggcgg acacagccac cagctcacac tgggatcggc	420
aatgcgtgct gctgctggac aactttccag gaagccactc cagtgcacgc ggtatttcaa	480
aatgcttttt gctgttcgag tctcagctag gatcttggcc ctcaaggaat ggatttgaca	540
atgtgcaacc cta	553

&lt;210&gt; 186

&lt;211&gt; 564

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 186

gggtatgatg ggaggggtgta tttttcagga taggaaagga gtagaggggt aaaagttgga	60
agtagcaggg tgagagagta ccaagatggt tttcttacgg ctacttggtt cttattttga	120
acataaagtc aaattatata aacacatttc gacaaggagc tataactcaa gtatgcggca	180
tgttgctatg acttcataaa actacagaga ttaaggaatt cagaatccca tggaaattct	240
taaaacagagt ttggacatat gttgtttgat tttcccttca gcaaactgggt aaacattaat	300
cttgctaacc accatattgc ttatcccgtc ataaaaat ttttggaaa	360
gtctaaaggg aaaaaggtaa cttgcaaaat aattccacaa actatataac taataaaaaa	420
aaaccccaaa aatgtatgga catatgagtg agtagctctg tatatattca agtaatccaa	480
gcagtgtcag gctttctcac ccgctgaaac tccctgggaa ggtcaagcat tcagagaaat	540
caggtcagat tacactgaaa agaa	564

&lt;210&gt; 187

&lt;211&gt; 525

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 187

gggagattga caagaaaaat gaaaaggtaa gtttgggagc atatgaaatt gtatgcaaga	60
ctcttaatag aatgacatat aaggataatg cttttctggt tcataagatt gtatgtatac	120
ctctcattta aacaaaactc agaaaatctg aattaacat agtggatggg tggtaaaagt	180
ttaactgagt tgtttttggt tttttaagg aaagttgcat caccaaata ttttaacatt	240

gctgtggcaa tactaaatat tcattatacc aaaaacaatt cattcacaac ttgaacatct 300  
 tgtgtaagtt ttcagatata taacatatat accttttatt caaaaacaga actgtggaat 360  
 tgtgttacct ttgttagtaa gacacatcta gcatgaaaac cttagcaaaa tcgttcagtg 420  
 atgttttagtg ttgaaataga tttctgttgt gttggaaaca taattgtcta ttactagac 480  
 atagattaac ttcatttaac aaaagaaaat gtgggccagg tgcta 525

<210> 188

<211> 619

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 188  
 taaaaaaaca tatgaaagta aaaaaaatct atgattaata ttctcataga gataagagaa 60  
 acatattcat aagcaagaag aggatataaa agttacattc agaaaacata aagcgctctt 120  
 gcaaattaaa aatgtgatag cagaaatgaa aaaattcaac aggcaagcta gaagaagggtg 180  
 tataatcatc tcagtaagta gagcaaaaac acaagagaga aaaaacgaga gaaagggtta 240  
 gataattaaa ggattaaccc aggcgggttca atagctaaat agttcagaaa gaggataaag 300  
 taaagaaaag taaagtaata nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnntaat 360  
 aagatgaaaa tttcctaaaa ctaaagctag taggcattca gattttaagg gtgtgctaag 420  
 tgccaagcgc aataaaacaa aagaaaagaa caacaaaaaa actccttctc ataccaaagc 480  
 acagcagcat gaacatggag ataaaaagga cctaaaagggt ccagaaaagt gaacaagtta 540  
 ccaacaggga gtgggagtcc acatgagaga tgtcagcagc agcactggaa gccacagggc 600  
 atggagcaat gatttcaaa 619

<210> 189



<211> 593

<212> DNA

<213> Homo sapiens

<400> 189

```

gggggtgaat agagcagggg cactgaagt tggctttcta atccaaacaa ttagattaag      60
tgacagtga  cataggaaag aacaaatatt tgctcagcct actgttaggc tctttgcaa      120
ctgctcccac gtggagactt agaaagccaa gtccaagaag gcgagatgat gccagacagc      180
tgccagcaa gccctggccc caggtgctcg caaatccct ctctttgcat gggcagtatc      240
ctattccact ttgggaaaaa acaagagaaa ctgagaaagc caagggattt ctgaagtatt      300
agaaagagat tagcactggt taaccacaaa tgacaggaac tagggagaga ggaaggccta      360
agagccagga tattctggca ggtactgtct taaaatcata cattaaccag gtgctttgct      420
tctcaggtac taaatccatc tgggaacaca tacatcaacc taaaggccaa gtctctagag      480
atcccttccc aacgagcttt ttctacocca tgctcccagt acacatgcaa aggcttttgc      540
ttccactggg gaaaaaaaaa aacaggaaac tcaagtagca ccgttcacac gca          593

```

<210> 190

<211> 535

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 190

```

gggggacttg gtggggaggg ccttcattca cttttgaaaa accagttact taattggata      60
ggcagccttt ctcatTTaaa ctgacttttg tttcaactta ccaaaaaaga gtttactttt      120
aaacctgttt actttttacac gnnnnnnnnn nnnnnnnnnn nnnnnnnnng aaaatgtggt      180

```

```

cttctgggtca tgtcgttttct taggatactc aggggaagcc agtccccatc tatatataat 240
agtcactgta ctgaaatgta aattttaaac taatggcgaa ctagttaagt aacatttttaa 300
tgaatatccg aagaagatgc aacagcaagt tagtttgata tcatcagaat ccaggtaaaa 360
agaaatacct gagaatccag caattattat taacaactct tttcccaatc ctttaatat 420
tctgaaagaa taaaaataaa ctcttagcaa tggaaacggg tacccaagat aacagggata 480
gaagaaaatg tactcttacg agtctctgaa ttttgaatta tctcaatgta ttaac 535

```

<210> 191

<211> 614

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 191

```

acttttttga ttttcagaag caacattgag caactatgac cctgggatag gacaaatttc 60
ttaaaccata aaaataactc acgtttgaaa atatttaaatt ttgtttacaa aaaaacccaa 120
agtgaagaagc tacaactgg atgaagatat gtgcaagaac aacaaaaaaaa caacaaaaat 180
atcaatatcc taaatacaaa aaactcttaa ataagagcaa aaacagaaaa ataaaagaca 240
tcaagacata tttcacagaa caggaatgac taataaacat gaaaatgttt ttaacttatt 300
aatcagaaaa atgcatgttt tcttttatag tgaagtgagt gctgtcacat tcataaggaa 360
aatgcaatgtt aaagccacaa taaaatacca ttttacacct aacagattgg aaagaattgg 420
gtcttatgat agcaagtaaa taagaaacca tacnnnnnnnn nnnnnnnnnn nnnnnnnnnn 480
nnnnnnnnnn nnnnnnnnnn nnnnnngtta aaaagctgat caggcacatg ccttacaac 540
caccaacttt gaatctaggt ttatatgcta aagaaactct tggacatgag caccaaaaaa 600
ttggatatga atgt 614

```

&lt;210&gt; 192

&lt;211&gt; 621

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 192

```

ggggtctgga agagttaaaa acagctcaca ctgaccaagc tggttctctc tagtgaacag      60
ggtgtgggtg gtgcttatgt cagcagccca gggccatgtg tcaggggtgc caatgggcgg      120
agctgctggg ctcgattcct gtggtttggc accacagctt gacttgcttt ggctttgatt      180
cttttcacac actgagctca ggttctcact gtctccttta cctccacct caactcacat      240
ttaccaagcc tctactgtga cctggctaca gggatgggca gagtgttagg gcatcacccc      300
gggtcctgga ttgtgtgagg gcgttacctc ccaagagaaa cctgcttgca accatgtgcc      360
aggccagctg ctgtgagaaa cccttctctt agtccagaga agtttgtgca ctttacttac      420
ttagactctc cttttctctc tctctctttt tttttttttt tttgagatgg ggtctcctgg      480
cacttgcttt tcttttaata tagaaataga tattgggatg ctatatgcac atattaaaat      540
atatggatgt tgaagagcaa gaggaaaagg agaaacttga gtaaagaatg cttggactgg      600
gccaggcgcg gtggcttcag a                                              621

```

&lt;210&gt; 193

&lt;211&gt; 481

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; ()..()

&lt;223&gt; "n" is a single nucleotide whose identity could not unambiguously

&lt;400&gt; 193

```

gggatggcga ggaccaaact caggacaccg agcttgtgga gagcctacct ggagggcctg      60

```

tgcgtggagt ggctccgcag atacctggag aacgggaagg agacgtgca gcgcgcggac 120  
 cccccaaaga cacatgtgac ccaccacccc atctctgatg tgtctctcac agcttgaaaa 180  
 gcctgagaca gctgtcttgt gagggactgn nnnnnnnnnn nnnnnnnnnn nccccctttg 240  
 tgacttcaag agcctctggc atctctttct gcaaaggcac ctgaatgtgt ctgcgtccct 300  
 gttagcctgt ctcaacttta tgtgcactga gctgcaactt cttacttccc tgctgaaaat 360  
 aagaatctga atatcaattt gttttctcaa atatttgcta tgagagggtg atggattaat 420  
 taaataagtc aattcctgga atttgagaga gcaaataaag aactgagaac cttccagaaa 480  
 a 481  
  
 <210> 194  
 <211> 722  
 <212> DNA  
 <213> Homo sapiens  
  
 <400> 194  
 agaagcaagt gatgttaatc aagagaatat atttattaca aagtaaaaat tcagacaaaa 60  
 ctagaattca atcaaaaata tttagatgta agaaagtcac tggaaaaagg agtatgtgtt 120  
 aacaaaagac tttttaaaat aaatcggtea ttaaactgtc tagtattgtg caactctaag 180  
 aacatgtgag aataagaaaa aaggaggaaa acaatctttt aaaacatgt cagatgatta 240  
 agctagcaaa cagtgaatca tgtctagtta tattgcattc aagttctagc tcttgttagt 300  
 catttatttt aaattaaagc atcaaaggag ttcaaaagtt gacatgcaca caaaaaaatt 360  
 gtgggaactc agcccagtta caccactctt acattaccta agatatgagt gaagcaggta 420  
 ccgagagtct taattaatgc ataggatatga ggcaacaagg aattcttaat tatgaagact 480  
 gagatgcaaa aaagcaaaaa cttagccaaa atagttcact ataaaatata tacataattt 540  
 ggaaaagggc ctcttttttt tttttttttg caatatatag tggttttaat tttcgtttac 600  
 tacatccaaa gtaagaaata tttttacatt ataaccaac aaacatttca tgaaacatta 660  
 tttaccttta ctacatgtta tagatgtgta tgtttcctat ttcttccttt ttttgtttta 720  
 tg 722

&lt;210&gt; 195

&lt;211&gt; 451

&lt;212&gt; DNA

<213> Homo sapiens

<400> 195

```
gagccagcgc accacaccaa gtgacaccag catggcggct cctcgtctgc cgtcatgcgc      60
tgataacaga ggcgttagaa ggctttcctg taaacgcccg acagagatta ggcattgagtt    120
tggaatgaga tcaacaactg aagtaggggg tttgtttgat tttgctccca aggaaaaaga    180
aaagagcaat caatgtcttg ttccaggact gtcagacaaa agctccttca agccactcag    240
ctggccttgc aggaacacag gcacctgagc ccggctgctg ctgcagctca aggtccctct    300
gggtcacgtg ggagagggat tctgtacca gaaagtggca gaggtcctgc agttggtgac    360
agatgccaca aagagagcaa actgtgcccc aggaaataaa cacgtaagtg aggtttgttc    420
ctaattctgc gactttttaa aaagccagag t                                     451
```

<210> 196

<211> 457

<212> DNA

<213> Homo sapiens

<400> 196

```
ggggtccctg atgggaatgg cgggaaagaa gcccagggaa gggatgtggg ggaactgggt      60
gctggagacc aaaggctcca ggcttgaag ccttggctgc aaaccgggga gctgggtgat    120
aattactgac acttgggctc atcctgaggt ccatcagagg tgcccaggca cctgacccta    180
aaacaggcag cgcttcatcg gctaccogag agactctcca gtttcagaga ggattccagg    240
ggcctgagca cgacccaaat aaatgagagg ctaacaccag taatcccoga gctctctcgt    300
tccccacca ggctgctct ccctgtacca ggcagaaaca gggacagacg aggcagtggc    360
ggggcaggat ttgtgagtgc caagcacttc gtccccctca cactggatct cagcaaccac    420
tggtgggta caatggttgc atcttttctt ttttggg                                457
```

<210> 197

<211> 469

<212> DNA

<213> Homo sapiens

<400> 197

```

gggctttggt gctaaactga gttgaattcc aagcctgttg gccattccca gcattgccac    60
tgctgtgtta gttttctcat ctgtaaataa ctgcctacat ctcacagggc ctctaatagt    120
taaatagatt gtaagctgca caagcatagg aacagtccat ctttactctt taaatagggt    180
tttggttttt cttaattaca ttcatTTTca aattctTTaa aaaaaagaat gcattggtaa    240
tatgaagaga tatgtatgat atcacagtac aagagcaata caatgttatt taaaaaagta    300
tgcttcatag aaacctTTaa ttcaataggc ttttaactga ttacaatgat atttagtaga    360
gtaattgtca gagagatgtg taatgtacta actgagacat gaagtttata agggccatgt    420
cacatgttta atgtgacatg tagagaaata tttattTTaa aacttggtg                469

```

&lt;210&gt; 198

&lt;211&gt; 512

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

```

<400> 198
attgaatttt tcttaaaatt ctcatggcat tttttccaga agtcaattct tgcttgtttt    60
agtgaccaact gttcaatgtg ttttagggctc tgcatttctt gtgttatctc ttttaataacc    120
aagttgtcca caggtaactc agctaattct gctacctcc tggccaaagc gaattgtcca    180
tctgtctgca gtctttccaa aatagatcta cattcatgct gaagattctc aatgctgtag    240
ctggtaataa ttgtatgatt aatggctatg gatgtatcct tcaaaatctg gcaaaggatg    300
caaagctttt tcacatctgg accatcagag aagagatgct ctctttcaac aaagagctgt    360
aaaagcttcc ccagctcata ctgggtctta cactgctgta gcataagctt caaaaggaaa    420
cacacctgat cctccagcca catggcaggg atgacagggg ggacctttgt ggctgctgtg    480
ttaagctgct gctgctgttt tttttctttt cc                                512

```

&lt;210&gt; 199

&lt;211&gt; 489

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

```

<400> 199
gggggggaga aatgaacttt gaaactatag ctgacatcgt tgttctttca gaggttacct    60
taatatgtaa gcctgcacac ttactctac taagtttcca ctgggtctga gttattctgg    120

```

attactctct tactctccaa tacaacagag cccttggtat acttgaattg ccattgaac 180  
 tcttctcaat atttgtcttg catatagagg tttagttaca gatttccttg aaacatagag 240  
 tttttctaag tcatgttctg tacttactat aatttccttc accccacact ttoccttttc 300  
 ctcttgctgg agtgcctccc ataataatcc tttatagagg gagtgatggg tgttttgtat 360  
 gtctgaaaat tcctctatct tgctctttct tttctgtaat aggcatacgt agatatttta 420  
 tttgaaggtc tctgtttttc atttccaaga tttcgatttg ggtctttttt atttcatttt 480  
 tgaaatggt 489

<210> 200

<211> 654

<212> DNA

<213> Homo sapiens

<400> 200

ggggatgttg tagtattgta cacatgtgtt aggttgaaaa tgggccttaa gttcttctct 60  
 caatgaaatg tggattccac agtcgcactc cattgctaca acagatcacc atctttcagg 120  
 ccagttcttg tgattacatt aaaaatagct cataacattg tccattacc aatcttttgg 180  
 ggaaggttac ttgactcttc tacttcattc agagcagtta ttgaagattg aatgtttggg 240  
 aaatgttgtg taatttcaac aacattagcc ttttaattcta gggctttaaa atctgtggac 300  
 aagagcaata gccaaaggagc aacaatttat atgctgttag ttgggctctt tcttcactta 360  
 gtgatctctc cgcactcttg cagctgtctg tgactttgaa gtgcattagg tatttcagtt 420  
 tttccccca tactttaaaa acgtgtaatc tcctttgtgc atttcctgtt atatcaagt 480  
 tttgagttct aaagacagcc atttgttaga ttagcatgtt ttatgggac attgtggaaa 540  
 atgttcttac tgaagacaag caagttggca attttgcct cttttcttcc tcacagtgt 600  
 ctttttcagc aaattgcttg gcagactgat catgactgaa tcatttcaat gaat 654

<210> 201

<211> 477

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 201

```
gggctcgggt ttgacagatt caggaacaaa ggcacctgtg tcaaaccctc gtagctcagg      60
agtgacgcga cctgctgtga cttgaggaac aaaagccaag acagaggcac acggctgtat      120
ttcgggtgga cacagggtaa ccataaatg aagatggaag gcatgggtgtc ctagaagcac      180
actgtgatgt cctagaagca cgctgtgagt gttttggcca aaaccaaata gaggcggctg      240
ttcctatgcc tggatctgtg accccgacag ggccctgac ctcttcagnn nnnnnnnnnn      300
nnnnnnnagt ctcaggctcg gctttcctga ccacagagat ttacagaagc cccaaacgca      360
ccttgccataa tttctaacta cggttcctc tagaccaggc atggaaagca agtgggaaac      420
atactctcct ctctccggtg tccacaggag acatcacaaa ttaatcatgg cactttc      477
```

<210> 202

<211> 432

<212> DNA

<213> Homo sapiens

<400> 202

```
aatgctcttc taattagata tataatcctg aagggaacaa agatcatact ttgaaacaga      60
ggattttaat aggacagaga agcagcaaag atagaaatat ctactaaaga tattctagac      120
acctaaccat ttcattccca ctttaaaatt gaaagaataa aaacgtgtta aggaaatagc      180
ttaatcctgg ggaagggtgg gctttaaaag ctatagatcg taatttaaga aagcaaacaa      240
acatttcaag cacaccaagg gcattccaaa tacccatgag ccactatcag cttagcaat      300
aaaacattac aaatacaact caagccctgc atgactctc ccagattccc ttatccttca      360
tctgtcctca gaagtaacca ctatcctgaa tttggtgttg ggtttcacg tttaaatatt      420
tttacctggg ta                                     432
```



&lt;210&gt; 203

&lt;211&gt; 464

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 203

```

gggctgaata aggatagcag acattgttg ccaagacatt tttcaggaat ttaattttta      60
gcgcctgtgg tcaggacttg cacactccat ttcttagccc agtactcttc ttgttttat      120
gtgacctcaa ttacacattt attttctctg cctagctcct gaaggcattt gagtatatga      180
tcccatctca ttctgtgcat tgtggtctgc tcaagcttcc taaagcaaag catcttgccc      240
ctgctcaatt atcattggct cctcttgccg gccatagaac ttaagcaagt attcgaaagc      300
acttctcagt ccagggtggc ctgttcttcc cttgttatct tccattacc cctgtaccca      360
ccttgctctc ccaacaaacc aatccccact ctgggccccc gattcacttg cagtgtcctt      420
cctaccacat ttctatgctc aactcttgcc tgtcctgcaa gtct                          464

```

&lt;210&gt; 204

&lt;211&gt; 522

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; ()..()

&lt;223&gt; "n" is a single nucleotide whose identity could not unambiguously

&lt;400&gt; 204

```

ggttggaagg gttattgcag agaccatttt aaggtaagc gactgccagg ttttcagaca      60
ggcagtggtt tgttctgtga cttatctgga taaccaagga gaacaatctc agggagggtg      120
gctaaacagg aattcttttg cacctttcca cctcttttta tttctttctc tctccnnnn      180
nnnnnnnnnn nnnnnnnnnn nngggaagaa gaaaaaaaaa aaccctcttc tggccctgag      240

```

cctaaaaatct cttacttgtg atgctaattct ttctctgctg gcttcacgcc actgctattg 300  
 gctctatgcc tgtttaatat cgtggttgct gatagcaggt tgtggctgtg tttccattat 360  
 aaagttcggc tttaaatagg tttctgagat ggagacacag cottacaggc aaagggtcct 420  
 cactttacgc ctctcatcc aagtgtgggc caggggtctc aggcctgcat ctgcaaacgt 480  
 ctccgactta gccgaattta aacgtgctct ttggagctct tt 522

<210> 205

<211> 727

<212> DNA

<213> Homo sapiens

<400> 205  
 gggctccatc cctaaccacc attaggcttt cttcactaag agttaaacag aaacgaaccc 60  
 tttggaaaga cctgtaccac tctgacact gccctgctct actgtggttt ccataaaaca 120  
 accaactagc attcttttct gataagagac caccaaccat agagggattc tgtccagtca 180  
 caaatcccca tcttgttctt tccttctca aagtgtttgt ttctagcttc tgaccagagg 240  
 caatgcttcc caggtgtca gtatggcacc ctgcatgcaa caacccttaa tgagaaataa 300  
 acctccctt tccaaatcta ggaacttcat tcttttagat acagaagta gcagaggttt 360  
 taaaggaaag aggtatatac agaatatgga aacatttgtt gggattgaat aaagtagaag 420  
 aaagtctcaa aacatattat taaaatggta actgttacat tttattgctg gtattaaaat 480  
 attaacataa ccatgagaaa agaagtatat gaactgcctg taaaagtctg aattagttag 540  
 accacctttg gactagatgt aagcagcttt cagttttaac ctgagtttct aggtggtta 600  
 ttttcttctt acttttatga tgtgattttt tttcttttat aaaataaaga cctaatatca 660  
 actccaaaat tacaaattct caaaggaaaa aatctaaaat ttgatgtcac atttaaaatt 720  
 gtatcca 727

<210> 206

<211> 661

<212> DNA

<213> Homo sapiens

<400> 206  
 ggggaaattg gtaaaattgt gagaggaatt tttagggcca atctcgtgaa cttggacaga 60

```

aggcagggaa agagagcaga gtatcgggcc ccttccttct aaactgttga ttttttttca 120
aaggcacaca ggcaataaga gccgggcact ttctgaaatg aaaaagaagg caacttttga 180
tgacagatta ggttaccctt ggatgagcaa tgaaattcta tgctaaaact gaataaaatt 240
catgatgcta aatcagatgt tttgcagcag tgttttgttt ctcaaacagg ccttcattgt 300
accaatcacc atgttcctgc aggtgggata atattttcaa aacactcgct ttaagaaaaa 360
atacaaaata aaaaaatatg aaagtgaggc tataactttg acaagaatca ccttgacagg 420
aacctgtgtc tgaccatgca agaccctccc tggcttcacg ttttaaagca gattcgctgt 480
tcagatgtct cagtgggaca cagcctctaa cataaagaat aactgtcaca ctacctcatt 540
aatcatacat ccaatgatgt atcatgataa ttatggcatg tgtaaaccct ttgcttttgg 600
gaggaaatga gaaaagaaga aaaatgagca ggagactaca aaactaccag aatttagtac 660
a 661

```

&lt;210&gt; 207

&lt;211&gt; 655

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 207

```

ggggaatttg ggaaagtgtt tttcaaatto tcatttttaa atatgtatta ctattctttt 60
gatgatttgt ccttcctat gggtacagat gttattacag aaattaagct atagtcggct 120
gattattata tagaaaaaat tgttctatgt aatatgggtt aggttctcaa atttttcaaa 180
ctgaataata aatacttatt tgagactttg tggaaaaaat ataccttttc taaaactgta 240
aatctccatg ctacttcttg taaagtgtca aaggatacat gaaagtgcc taaaaatgat 300
gaaacatgca aatatttcta ttattatttc ttgacattaa ccacaaagct tcatcaggtc 360
ctaaaactca gtgagattag gctttgtttt aattcttccc ctctccccta gtcacaggaa 420
aacatcaatt aaattgcatt gttaatctaa aatacttaca tgtgatgctg caaagtaggg 480
gaaaatgcct ttacttagat taagacacac agctttactc tgaggagct gttaaaaagg 540
aaatgtatta tgcttggtgt tcatcaaaca aatcaacccc atcattacgg ccacatgtta 600
ttttgtatg gtaatgtcag ttagaagaca atgaaaaaat atgacaccat gaccg 655

```

&lt;210&gt; 208

&lt;211&gt; 412

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 208

```

gggagctggg gcgagagtca agtgggggca cctggaggcg gagaggtagg aaccatcaca      60
tgaaaagaga aaagaaagga accagctgcc ttaaaacttg cctattagcc ttctccctc      120
tccacctccc cactctcttt cgaggaccca ggagtctgt ccccgagtc cttccctcct      180
ccagctctgg agaaggcatt aggcaggtag tagaagcaag aagtgggtca acctaaggaa      240
tgggaggagt ggtgtatagg acattagaga gagtctcca agtgggagga gggggtgact      300
gacggaggaa cccagaatag actccaatgc cccagctccc actgggccgg c'acccctaata      360
cagaggctac gcagcgtgtc tgccttcttt tatgttttat ttttattttt tg              412

```

&lt;210&gt; 209

&lt;211&gt; 403

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 209

```

gggaaaaacc taagaatatg ctaactcatc tgaatccatg taagaaacac aaacttgaac      60
aagaaggtag caagagagag aatgcaagg gtcaacttaa gaggattatt aagagggtgc      120
aaccttgaag aatgccgac tcctctgaaa gtacaacagt cattttcaga tgtttgaaat      180
cttgatcttc agatggagaa agcgtgtagt cagccatct ctattagtgc tttctctggg      240
acttcagaag cagccacctc atcctctcag ctgtttttct aatttgaaaa catggaaaag      300
gtcttcaata tttattcatg tgtgttcccc tttccttcac acagagattc tgaaaagcca      360
tcatgtcttg tccttacaag aacaggcaaa ggccagagtg ggt                          403

```

&lt;210&gt; 210

&lt;211&gt; 557

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 210

```

ggggctaaga gttgccaatg atggcgggct caagggaccg gcctaaaggc cttgctgagc      60
caacaggaga catatgctaa acatggcaat agaaaatgag ttattgcttt acatgtgtta      120
gccttgctat gtacaaggga ataatgggta acactttttc cttttttttg cctgaatata      180
aagtcagcaa ggaagagaat actgagttag aaaggatatt aattcttttc ttactgcttc      240
aaaatctttt ttttttagtt ctcatctcag tgaggaaaat atgccagca acaatattag      300
acagaccctt gttggcctac gtaggctatg caaagctgtc aaaaatgata acacactaaa      360
gacaaaccac aagtgcctac caactctttt tagaaacaac agaaatattt gcttggaag      420
cttgagttag tggagatggt gaaatactaa agaaagtaaa tcccaaatg aaggttttta      480
tagaaataaa gtgcgctggg catattttcc tcaactgagat gggaactaaa aaaaaaaaaa      540
aaaaggcgcg ccttaat                                     557

```

<210> 211

<211> 534

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 211

```

gggagcatcc ctgctgaaat ggggtgtaac tccctatctc ttgttgacc aaatatltta      60
ttgctacctt tttttccatt gctataagtc tttgtgtgcc tatacattaa agaattctta      120
atagtgttaa tatcggaata catagttgat ttctaagtaa tatgctccag gtggcaagtt      180
aacacccatt tcagcaggga tgctnnnnnn nnnnnnnnnn nnnnnnagca ccggctgatg      240
tgaccgtctg tgaggggtat ccgcgcgctc ggcgttctgc tggattctgc tagacctctg      300
ttcccagcac caactctctt cagtgcctcc tacttacttc tcctcctaag aaaaacctgc      360
tctcaagaaa gggataaatt catttacttt gagattataa ggcttaatgc tacctctttt      420
gagggtcact tgctttttta caaggtataa accttaagcc ttggtcact gacctgtgtc      480

```

aagaacaatg aaactccacc actagttgga gaagtgtatt tttcaccatg gaaa 534

<210> 212

<211> 536

<212> DNA

<213> Homo sapiens

<400> 212  
 ggggtgtttt aaataactga tttggcatta attaactgat ctcttccatt attaaccaga 60  
 atgtactatc tataaatatc ccaacttttt tctgatgagg aatttaatat gtacaagatg 120  
 ataacaaata tcttaccaca tttgacttaa acagaagatg ttgctcagtt aatatacctc 180  
 gtaaacattg gaattggcca cgtaagcaca gtaagctgtg ctgggggttc gtggttgga 240  
 aactgacca gagtcaatta ctgaacaaga ggtaatttat tttttctttg ttaaaaattg 300  
 tttacaaagt caacctaaac tggctgcgtg gaaaccattc agtaccata gcttttcct 360  
 ttgtcttgaa aaggaaaact gtcaaaacca gttttgtgaa gcaagttact ttcccagagt 420  
 tttctcacct tatcaataaa gattacaaat acttaataac aaaatgataa acttttacag 480  
 tccatttaaa aaatctatgt tagtaacaat atctgacact gtagttcact tatgaa 536

<210> 213

<211> 729

<212> DNA

<213> Homo sapiens

<400> 213  
 ggggggcttg gagaggggga tgtttttagt ttttattgtg catattattg acggtggttt 60  
 ccttattcta atcctatctg ccttctgtct ttagggttct cacagtttct ggtccactgg 120  
 ggatacttct tgttttccgg tgctttcata gttgcattct gggatttgga gtgggaggag 180  
 gtggtggaca ctcatgctgt ttggcctctg ggtcctgggc ttcctctcct cagcactcat 240  
 cagactgcac taagatgatt ccgagactac ccagaattag tgaacgtag gaacatgtca 300  
 gaagaaggat ggaactggga gagtttgtcc tacaaggcaa aagactctga ggagaaaaag 360  
 aaatattgaa aagggtgata catgaagaac tagactctaa ttctgctaga actccaacca 420  
 gggggacctc caaggggaag acacatgcag ttgatctaaa ttgatgatga tgggtggcgtg 480

tccttttata gacagggagt tccctgtcac tggagcttta ggagaaatca ggtgaccgct	540
tggcaagagt attgacgtgg aagaaagctc aggttcagat gtgttttcga ctggagggtt	600
atccaactgt ttattttaaaa tatgggtcca aaactgctct ggctgttgga aatatcgaga	660
tgaacaacgt aaggcctctg ccctctagaa gatcccaatc tacctgataa tgatggcact	720
gatgcttgc	729

&lt;210&gt; 214

&lt;211&gt; 676

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 214

cttcgcccc gcgcgcgcgc ggcctcttcgc tcaccctccc ccatttcctg aaggacaacg	60
gctctatttt actgggggtcc gccatcgtct cgtcgcgcgc tcttggtctt tcttgtaagc	120
cggtagtttt cctctccact tttgatgact cgtcattgct agcagtagcc ttctctcttc	180
atagcggagt gatctttccc ccaacacgac ggtcttagtc gggtcctga atttctctt	240
gtcccccttc acctctctcc ctttcccaat ttggccccct gaggcctcct cgccaccact	300
gtggccttcc gactggcgta gcttgaagtc tcggcttccc ttcattttgt ggtcatgacc	360
gtggcctacg tgaagtgaag ggcattttcc tgcccttctt ctagaaaata cacggtacct	420
attaacctct tcagctcaga gcctgtggtg acgaccgtcc tactccttga gagattccca	480
agagatccgt ctttttagca gagcgaggaa agcaaact tactcaagat gaccctaggg	540
gagccgtaac ttggctggtc taagggggtg cggctctgaat caggaacagt ttctcaaagt	600
gtttttattt atttccaga atgtaatcct ttcgaaacaa tttgtcaca actgaatttt	660
caaaagaatg aatctg	676

&lt;210&gt; 215

&lt;211&gt; 558

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 215

ctagaattat aaaccttact ggatgggtga gcatttgag cataccttc aaattcatta	60
ctgaaagtat gtataaagaa gtttacatca gcccttgatg ttgctagtt tatttgatga	120

acagacccaaa tggatatgct atgttactca atttgtggcc ttaatagctt ttttttcaa 180  
 aggcactggg tgtagaacat aaactataat aaggtcagca gcagttagtg tggcaccact 240  
 aacgatataa tatgaaaaag gggccttctc caaatgatta caggatacga aattcttgcc 300  
 tgtaactgct ggtccaagtt ctacacttcc tgaatgacta ctataatttt tcccccaaaa 360  
 attgctcata tatatgctta gggtgacctg aacgactatt ctacttaatt tatttacatt 420  
 ttattaagac aatgcaataa attaggtcta aatattgtta ggatcacaaa tattacatgt 480  
 aaaacattta gataaaatga gattatttcc aattagggga atgtcctttg atccttcaact 540  
 tatgttttgg aagcagtg 558

<210> 216

<211> 704

<212> DNA

<213> Homo sapiens

<400> 216  
 gggaaggcgt ggagctaagc cccaagaata ctatctgcct tcagggtgtc acgtttccta 60  
 accgaaactg ggccaagact ggaaaaagcc acaggagctg cctcatggcg gatgtagaac 120  
 tcaactgattt attggacttt tccacatcta ggcctgcccc aagattctga cctgctagta 180  
 acctgggcag aaccagaag gttcctataa gtcagactcc aaaggccagt tctttcaaac 240  
 tgctcatctg taggaggata catgtgtctg aaacttattt aatattctac aaacacaaac 300  
 cgttcgccta tacatagttc attctgcaga tagtgttact gatgaccaat agaccccgag 360  
 tgctttaatc aatgaaatta ctgcctcggc tattacagga gactatgaac tggtgcaatc 420  
 ttctatccac atttcaatcg atgtaaacca gggcaagaaa aaaacaggac ccttaattat 480  
 ataaccggga aggattatat aacaaaggtc ctgatgcagc tttaactgtc tccgtgccta 540  
 cgcgggctga aagagcacac gttttcagag ggaacatgag cagcccagag ttgtgcaaac 600  
 catttttcaa tattggttta actaatccca ctactcacc atcgacaagt cctctgctct 660  
 tctaaccttg tttttccaca gccctggatg gagcaacccc attt 704

<210> 217

<211> 501

<212> DNA



<213> Homo sapiens

<400> 217

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ggggaagtgg taaggaagga ggctggagca aaaggagaga ggacgatgga tgccacaggg      60
ccagaactct gaatttaaata gctagactct ttgccacaaa gcgtaatgtg tatgtccctt      120
tggaagcat ttaagtttta cagttaaaac ctttaaaaat atttcatata ctcttgctcc      180
ctcattcctg ggaacttgct cttaggcaag aaagagagaa aaagaacatg aataggactg      240
ctctttgtag cattgtttat ttattttatc tttttgatgg ccctcaggct cacagatttg      300
aattaatcat aatatttaata tcatgagaca ctttcatcat tggtcgatgc atgaccctct      360
gtaatttaac atatttcttt taataaatat gttaatgtaa tagacacca tgaaccagtc      420
acccaaatat aagaattgaa aagacagtat tcagaagggg gagcatagaa agaaatctaa      480
aaataaatgg aacttaagtg t                                          501

```

<210> 218

<211> 591

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 218

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gggggtaaac acgggagcag agtgaggaca cctaacacat atctgtttgg agtttcagaa      60
gagctaatat ttgaaagctg acagggtttt ccagaatttt ggaaagatgc tccttctcag      120
atccaggaag cctggtgaat cctcagcaag ataaatcaaa gaaatcccca cctggacata      180
tcatcaggaa actgcagaac accagaggaa gaaaatacct taaataaacc tacagagaac      240
aggccattca ttacaaagaa atggcaacta aatggatagc taacttattg acagcaacag      300
tagatgtctg agtggcatag agtcttcagt gtgctgcaag aaaaacacag tcaactagaa      360

```

agccattgct agcaaaatca tctttcttcc aagaattgnn nnnnnnnnnn nnnnnnnnnn 420  
 nnnnnnnnng gaaacaacaa cagcaacaaa aactgccaac cccagaatt ctgtattcag 480  
 tgaaagtgtt cttgaagagt aaagttgaaa ggatgacatc tgttaataaa aactaagag 540  
 aatttgttgc cagcacatct gtaccacaga aatgttaaga gaagttcttc a 591

<210> 219

<211> 617

<212> DNA

<213> Homo sapiens

<400> 219  
 ggggtggggg ctgggggaga agctaatac taacattgtg ggcaagaagt actcaagggtt 60  
 aacaaagggtt aatcctttgc ttttggtga aatgttatca gttcaatatg attttcacta 120  
 caccttcacg attaggagat atgatgtatc tggtaattt tttttaatag aagtaattta 180  
 atgcttattt aatacagctt gctggacaaa atttttcaca aggaattcat ccaagaaaat 240  
 gaaataataa aagggtcat gatgttgaga aggttgggaa ccaggacttg aggaatttac 300  
 agcacaagtc ctcatggagc ccagaaccag atacaaatca catctggtg tocctctgag 360  
 gatggcaagg caggtggcaa ggcttcaggt ggtgtgcaag gggcaaaagg gcagcgtggc 420  
 caggtagtct ctgtcagcac taaactgatg acaggggaat ggggagaaga ggacaggcag 480  
 ggcttcaagt atggggccca tgtgattccc agctgaacac caagattaaa aaaaaaatac 540  
 ataaataaac accagctgct gtagtcagag ttgccaattc ttctcttctt cccatttgct 600  
 gctgcactga gtcacca 617

<210> 220

<211> 628

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 220  
 gggaagggat agtcataaac atagggcggt gtttgtttga aaatgtctaa gttgaaaatt 60  
 tgtgtgcatac tgatgaatca tgtaaagtac tcatggatat ttgaaagaga acgtgacnnn 120  
 nnnnnnnnnn nnnnnnnnnc atcgctacaa atgtagnnnn nnnnnnnnnn nnnnnnnnnn 180  
 nnnnnnnnnn nngtagataa aatacactca tttatatattt acagaaagag ttttagagtt 240  
 ctgtttttaga catgtaagtt cttaatctat ttgaagttga ctttttaatg tggcttgaga 300  
 taatgacca attttatctt gtcaatatag aaaaccattt tttgtggcct gaagcacagt 360  
 ggctcatgcc tgtaatcctt cttaataatg cataaaacat gtactaccac gtaagaatta 420  
 taacagcctt taaaagaaag gaaggatcaa cttgcttttt acctggcata tctgcttgat 480  
 caatttgagc cattgttatt aaatgtctgt tgatcagctc ctatgaaaca gaaataagta 540  
 tatttttatt taaacacaga ttctgaaacc tggaattcct attataatta aataacctaa 600  
 gtattaatat ttttggcata tgcacttt 628

<210> 221

<211> 486

<212> DNA

<213> Homo sapiens

<400> 221  
 tggggtgtag aaaagatgct agtttttcta tctgggtaag taaaatttaa atatatgttt 60  
 tattcagtat gaaatgaaat gatatgtaag aaggtagcct caaaaagtga aaaagcagct 120  
 gtataagatt atttcacatg actttatgaa tgataccttt tcaatgaaag caaatgatcc 180  
 agggaactctt aggaatttaag actgttatctt ctcctttttt attgcttatt atagcatcac 240  
 ccaaaatgga aacaatgaat tagcattaac tgatctaatt ctttattaat caatatatta 300  
 agaaaaatatt gcattaaaaat aacatctaaa gttataatac catactattt aacttttctt 360  
 taggtatttc caaaattaat aaactcaatt atacataggt gttacatgtc aaaattagcc 420  
 atggtaaactc tcaattctat aatctgacct ttctaaaaac ctgaaaatca aaagtttatc 480  
 ttgaat 486

&lt;210&gt; 222

&lt;211&gt; 568

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 222

```

gggtctgaaa cttgttcaac tgtaaatact tagtcatcat gatgcgcgcc gcttaacatc      60
acaagatact aatgatttaa ctctcataat caaggaatta ttttatcaag tagaacatat      120
cactatatta gaaaggtctc catatatcaa aaaatatgta aacttttata atgaaatatt      180
tgagttttac attactggtc attagagcct taaggcttgt tcaatttcat ttcttggtat      240
cactcagtag tcaaggagaa ggaagcatca aatgtttaag aaaaaaatac taagaactt      300
acattcaaca tatatcgaca aacttttaaa aaactgaatt ggaaagttgc cataaccagt      360
ttcagtgaag gaaaacctca agtcagcccc cataataatg gtgttttcca ggaaattagg      420
tttagggtaa gtggtctggt agaaattctg aaaacatttt tcctcttttt aaaaaacagg      480
tcacagtaaa aattaatggc ttcttcaag taccagtag actcctatat acatgtaggt      540
agaccaaaaa ttaccagtga gctccaat                                         568

```

&lt;210&gt; 223

&lt;211&gt; 506

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; ()..()

&lt;223&gt; "n" is a single nucleotide whose identity could not unambiguously

&lt;400&gt; 223

```

ttaaagtaag tcaatacata agtgttgcca ttacagaaa tatatgcatg atatccaatc      60
tgtcatgtga tgtccatttc tgtaagtaag gacaaccaag tccaacaaga caaagagcca      120

```

```

aaaaacttac gttagattgt taaggactcc aactttcctt cagataggac tcacctcttt 180
tcatagaatc atgactatatt aaggattaga taacctatat agcctattaa aagttatcct 240
ctgaatgtct gaatgctggt tacaacatcc tggccaatag ggtcaatgca caaacctggg 300
caacctcaag gacagaagac ttgcttaatt ttttctatcc atttgtcatc ttgaaaagc 360
cgnnnnnnnn nnnnnnnnnn nnnnnngtgt ttccttaaga gttatgagtt atactctgaa 420
tctaacttac aaactccaaa tctatctttt taactgatag atttataata aaagtataat 480
catatgcaca cagacacact cacaca 506

```

&lt;210&gt; 224

&lt;211&gt; 515

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 224

```

ggggaatgcc tgtgctaaag gggtcagtgc catgggaatg aggaatggag aggatcccag 60
gaagcacagg aggcaacaca agtcaatgcc tcagagccag ggaacaggat gaacaagaac 120
aatcagaaga tgaccttgag ctaaatgaag caattgcagc aggtgggtgt ggtgaacat 180
cagaccacgt cgaggtgagg aggtgggaaa gtggagatgt cattctctcc cgaaaattt 240
ggcagtgcag agacggacag agattggata agaacttgaa agaggaacag ggttgaaaa 300
tattgttttaa ggaaaggaat gatttttgta tatttttagg ctgaagagag agatgggggt 360
gggggaggat gcgaatagca tgaagggtga agggataaaa gatgtatttt tataaatttt 420
ttgatgtctc tcttcttcat cagagcaggg attcagaaca atgtgacttc tttccagtct 480
taaatttaga acaactcaac gactcctctc aattc 515

```

&lt;210&gt; 225

&lt;211&gt; 662

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 225

```

ggggctggtg ttccaaatgc caaatgaaga aaggctttca.aaaatgagtg gtcaacagta 60
tcaaatgctg ttgagaggtc aagtatggta caagagacca aaggatgtag caatccttaa 120
atcagttttg accttacaag gagtgatttt agtgggatgg taaggatgaa ggccagacta 180

```

```

gagtggcttc aagaaagaaa caaaggtaaa aaagaagcaa tgataccaca cgaactcttg      240
cagaatattt tacagtatca gggaggagat aatgaagca gtagacagta ggaatgtggg      300
atcaaaaaca ttttttaaac atgaaatctt actgtaggta ttctaaaagg gaatgatcca      360
gaagaaagta gaaaactgat gatgtcagag aaacaacaat ttacgaagac aaagtctttg      420
agactgtgaa aggagatgga atccacacac aaggaagggg tgactggcca taagggcaaa      480
gacagtgcac ccactgtata agaaaaaggt gagcacatgg acaaaaatga aggtagggta      540
atTTTTTggT ggaaatacaa attctcttcc ctctaatacat tttttcatag gggaaaaaag      600
aaacaatgtc tgtttaagac tgggaacaat ttaaaaagta ctcacacgct tcaccattga      660
ga                                                                           662

```

&lt;210&gt; 226

&lt;211&gt; 727

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

```

<400> 226
ggggtggTca aagagttgac aagatgaagt ttccctttct aaaagtatcc catagatgta      60
aataagcata gagataaatg aaagaggaat aacaggatta gaatatcacc actgtgcatt      120
gtctaataca ctaatggctc ttgacaataa tcatcaacag gtaacatcac agaaagagac      180
aagcagcaac tagacagtgt gtcctcctgc taaaagtaag taacgtcagt tgtgaagtag      240
tcctgtccct ctcaccacaga aaaagcgccc gactctgacg aagctttcag gaaatctaac      300
taccaaggta cacgaaatac agaaacagaa gagcacgtta aatgacacca caggcatgtt      360
tgttttctaac ttggTTTTTT agttctaacc tgtcactatt ttaaaaattg tattgataaa      420
tacaataaaa atacattaga aaagagaaaa atacttataa aatataagcc ccaatttttt      480
attcatagat tcaaaagaca taaaagtaca ttctaattag aaaaaaaga acaagaaaaa      540
aaattaggaa agctatacac attatttatc gaaggTgcaa atacagacaa ttattagaaa      600
attcctatta tactcacaac tttctgttat tctgcagtca taactaggta aagttatgag      660
actccataag aaaactacat ataagatata tataaaacta tatatatata tctctatgaa      720
aactata                                                                           727

```

&lt;210&gt; 227

&lt;211&gt; 690

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 227

```

gggtatctga gaaatgcttt ggcgggtgct gacaaggctg gcccgagct gagagacagg 60
ttgggctggg ggcacagatc caggagagag ccttctaaag gacgccactc atcagacgcc 120
tgaagttacc aatgcctgag actgtccaca ggtggggaag accgggcat ccttcaggag 180
acaagaaggc aaaccacgt aagtgaagga gaatctgcaa agcacacagg tactgcagta 240
aagctctgct gcacaagact ccattgcatt tgctgaataa ttcacactgt gtatcacagc 300
tctgcacgca gccaccata gaaacacaac tgcataacg cagatcattt gtagattcca 360
gatcttcagt aatatttatt cagatttcca cttatcctgt aaatcaccag ttctctcctt 420
caaaaattga cactaattt ttacaaagtt tacaaaaata tttgtgacta aatatgcttt 480
aagtttaag taataaaaga ctagtattag ttaccctctc ctcaaagtat gataaaaatt 540
attcactttg aacttatgaa atgtcagaat cttcagttga acacaattat tgtgacagaa 600
aattctatcc agtgggctaa tccagaactt tccaatcatt aatcacataa ttacataaac 660
taacctgtga ttaatttatg taattaaata 690

```

&lt;210&gt; 228

&lt;211&gt; 431

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 228

```

ggggggagtg ctcagagcca ccttagcgca aagtgctaac ttttgaattg aggcagtgcc 60
aggggacgca gtatccgcat cgcactctaca ttttaactcg ctgtgaaatg agaacgcaaa 120
gacgatttag gttttattgt ttccgactta ttttttccg aggtctttga ttacgggaa 180
attgttacgt actaaatctc atatagcaag agatttagaa aaggaagcta cagaatctag 240
gctaattgat ctaatagcat ttccctgcttt tgctcttttt ctttgccctt ttcccctact 300
ctaagaagtt catattcaac tgaaaagcca tgaaaattac cgcttttgct cctccttgat 360
ataacaaact gctttcagaa accgtacaag atagtacta agggaagtca cagttcaaat 420
gagagtggca t 431

```

&lt;210&gt; 229

&lt;211&gt; 708

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 229

```

ggggggttgcc gagtggtaaa aaagatgttt gaataaacag gaagtactgt gcggctgaag      60
cacactcgaa gagaaaacac actggaacat tgccctttgt aggcaacctc agggagggttt      120
gcctccacag tagctggctg ggctctcact aaatgacaaa gaaaccacaa gaattcctca      180
agtaattctt cactttcaaa gttgaaagat cagttggagc ttgcaggtaa ttttcaaagt      240
tgcathtagc acttaaagaa atctattaat gccacacata tctaaaccgc tccaggctctg      300
caagcagcga cacagcacac gcagtgcgcc ctggctagac caagccctag ccaaacacag      360
ctcattcacg cagacaaata cacaccaaca gggtttcggg aaacctgctc ttgagatatt      420
tttgtggtga catttacata ggcaggatgc tttaaaagaa aaaaaaaga agaagaagaa      480
aattcagatt ttgcagactt tagaggattt tgtcacatgt atttttaag aacacatcgt      540
cccgtattcc agggatatgc cctggatctg gctttgactg gctgtccttt acattttctt      600
tctccaccat caaccaaact acctgtttat ctccagatgc ctagcttgcc taatggaaca      660
ctccttaacc cgccccaaaa tgattgtcac agtctgtct tccgtcac                      708

```

&lt;210&gt; 230

&lt;211&gt; 569

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 230

```

gggaaagctc ttgtccatcc tcctcttgcc acctgagggc agggagaggt gccaagcgc      60
gaatgtgcag gaaactcccc ggggtgcacc tgggaccag gaagccaggt ctggaaaggg      120
cctatgaatt ctcaagtgtc gcggatgcag ggggggccca ggtcagagac actgcatctg      180
ttgggtgtcta gcctccttcc gtcctgctgc gtgtgctttt tcgtcttgct cagaactgat      240
gccctgtttt tgctcctact tgcttggtcc tctgtggaga aggggtttta aaatggctta      300
taggggtgctg gaagtgtggt ggtgattatg tagggagaaa aaaggaaaac aactaaaacc      360
agtatgaaaa agcttcccc aagaggagat agtatgtaga aaagcccat tttcctttta      420

```



tttaaataatc ctaaataatat cacgaaggaa catacactgc actttaatgg taaaaagata 480  
 caagtttata acatcttata aaaactacca tttaaaagtg atcttgtcca tttgatattc 540  
 ccctcccca tagcaaaaata ttattcaaa 569

<210> 231

<211> 517

<212> DNA

<213> Homo sapiens

<400> 231  
 gggaattcca atcaaggctt actcatgttt ttaactacat ggtctaacac caaactaagc 60  
 accctgaata atataatgca tgctgtcgag aaatgctatt gtgaaaatga ataggagaga 120  
 aaagagccat aatacagatg cccaaatgag tgctacaaga ggggcaaaag tgtgaaataa 180  
 aagcaggccg ggtggtgtca aattctgtat gatgtgtggg ttgaggaggt agagcaggga 240  
 gtctggcctc tgaggaggca aaaaaatcga actcactcaa acttgttttc tgagcgaatc 300  
 ttcaatttgt ctaagacttt tccttgaggat taggaatttg ccaaaaaatt atcagcacct 360  
 attaggtgcc aatatagtat agacatggac cctgtcttca tgaagggcac agtctagcag 420  
 aaaaagtagg gcagctttca aagatgggtcc tgtaatatatt tctgcttcac actcttctgc 480  
 agtgcaactt tgccattctc acattaagag atgggggt 517

<210> 232

<211> 485

<212> DNA

<213> Homo sapiens

<400> 232  
 aggccttagg gtactttatt tttcaaacct aatctgtctt tttgttgctt tcacacaagc 60  
 aaaaacaaatt aacttggtca cagcctttct tctgcaaact tatatagata tccctttaat 120  
 tacttttggc aatttatcat tgccaaaaaa gctaaaacca caggaatttt tattcctttc 180  
 taggtaaacg gtttctacca tctggatgct tggatgctta aaggacttgt tgctgttttt 240  
 ctttactcct gatgggtata tgtatgaata gcttttcttt gattgtgttt tgaatacagt 300  
 ggacctttgc acttgcgtag ttacgtaaaa ctgccgctca ggagagtctc ttttaattatg 360

ccctcaacca ttgtttccaa acaattatcc tgcctttcttc ctaaggggct tcaatcattc 420  
tcaggttgga tctctgaccc ctgtcttaca tagatcattc tctctttcta tttaatctct 480  
ttgtg 485

<210> 233

<211> 724

<212> DNA

<213> Homo sapiens

<400> 233  
gggggagcgg gggccgcgcg acccgcgcg ctcctttctgc tcttccttcc caccgcgccg 60  
gtgccgcctc gtcgccctcg cctgagcgtc tcccagcccc attgtttctt catcagcctc 120  
cttcggggttt cagtaaacgc ctggttcctt gcattccagat ccttggtatc cctccgggct 180  
gcctccctgg aagggatccc ccacttcctt tgcctcacta gctgcttccc ccattccctc 240  
ctggctttct gttccacctt cctcctgct tttgggttac cttttcatcg cctctatagt 300  
agcttcagtg tagtttcttc gactcatttt aaataccata ccagttacc cgacttttat 360  
ttcagattac cttctttgtg ggagtgaag taaaaggatt caatttggtg tagggaaagc 420  
ttcttgaaa gttgggattt ttatttgcct ctggtggaat ttaatcattg tgtgtccat 480  
acttttgact ggggtgagtt tgtgactgtc agctctgccc ccagctttt cacatgggga 540  
tatggaaaaa ggcattttgc tgatactctt ttatcagttc ctggaactgt taattctggc 600  
ggcttgaatt cagaagcttg agtgtaagc gtagactgtt ggaattccaa atggattaat 660  
aaatttactt acaaataaca tacatccctt aaaaaaatgg caaatgatg tttgatgatg 720  
cttg 724

<210> 234

<211> 623

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 234

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ggggggggg atttgataac ttgtctccaa gatatcactg ttttacgtgt atgtgcatgg      60
tccattttaa ggtggggatc ccacttcccc agccgatccc tcccaacctt ggctcctcga    120
taagtttctt aaagtgctaa catctggggg aggaggagag tgcgtcagtg tttgacggcc    180
ccgccgccct tgggtgcctc ttctgcctct gccgcacctg tcagccctgc gactgccccca   240
cagtcactgc tttgtggaca ggtacatgtg gtcaaacagt aggtgaagga caaagcccag    300
gaaggccaga ctgcacaggc gcagcaagga gtgaggcctg ggggtgacac actgcctgtg    360
ttcctgcttg agctgtcttt ccctgtgaca acagaaagcg tctagaacaa gtgctctctg    420
agcctcagat aggagcctgg cagnnnnnnn nnnnnnnnnn nnnnnccttt ggtcagtgc      480
tcatagctga cttgagcagt tactaaaaaa actccaacta atttctgaag gagggccctg    540
gggtgaagca ggccacagga cagtgaccaa ggtgtcctgg cttctggact ccaggagcga    600
gagggtgagt cccccagcac ccg                                           623

```

<210> 235

<211> 555

<212> DNA

<213> Homo sapiens

<400> 235

```

gtgtgggtcca tctgcagaga aaagtagagg tacaagtgcg ggttctgtgg agtgcaaaga    60
agtccccacg ctcaggatcc ccatccagct ccagccacca cacctggcac ttgatgcctg    120
ccaggctgca gctgcaggtc tcagggtcgc agatcctatc gcagtgcagc ccacaatcct    180
cccgggattg gcgcagtgcc tgcagctccc gcttctcctc ccgatcgatc cttcgcacac    240
ctgaagccct cagcagagct cgacgtcgcc gggctgggta gggctgtagg aagctcaatt    300
cttccaaccg gccacctgcc acagcgactg ccaagtcctc ctccacagag gcgtcatcaa    360
tggcatccac cacagatggc agccctgcct ctgcctgggg taccacagct gccgaaagct    420
gcatccacag gaaagaggga tgtgagaagc acagacatgg acatgggctt agccctactg    480
tcactagaca aaccctcacc aagtgcctac cccgccacta ctcgtgctta atctgcgatg    540

```

ggcactgtgt gtcag

555

&lt;210&gt; 236

&lt;211&gt; 598

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 236

```

ggggtgtttg ggggagcaga agaggaagat agaagattgt atctctctat cttcttgtct      60
tggctttctga acccgagatg ttttttatta ttgcaggaaa agacagaagc tgattgaggt      120
cccagcttgg taacagtttg aagagttgca ggactggctg gatgagtact ggctgcagc      180
aatcaggctg ccaggattct ttatggctgt ttctgcttcc actacagctg agtcagaaaag      240
gtcgctgccc cgtggtggca ctagacgcag tggatctggc aagcaaagt ttccgctatt      300
agctctcggc aacagagact catatatggc caccttgga atctgggctt atcgatctac      360
agcccaagtc tgctgagaag ctggagctta cttaaagggg aacctgagag ctgttcaagc      420
cccaaataat ttccacttct ggtcacctc tgctgtctgt tagcagagtg gaggagaaaa      480
tacacagcac aaacaacgtg aaaaaatagt tactctattc attaaaagct gtaacttcca      540
gattggactt gagaagcaat taagcaacag aggaacctca tctactatct gtattcag      598

```

&lt;210&gt; 237

&lt;211&gt; 771

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 237

```

ggggactctg cagcctcctg ggaatgttgg tgctgggtat tggatgcaag agtgtaggca      60
aacgaaggca gaaggaagtg cactcatgct agcccaatcc tgcattatit ccccatatga      120
tcacactcta tagcaaccct gtgagagaac agtgatcag ctcttttttt caggtaagga      180
acctggtttc agaagagtgg agtaatccac ccaagtccct caggcagcag ggaaggaata      240
gaaccaagac tcaaattctc atgacttcaa atgcatact cttttcttac cctacccac      300
cctagtacat atctatcacc cctcatagaa acaactcatg tttatctcca ccaacagagg      360
gaaaatcgca ttatgtttta ctctgaatta tgaaagagat catcagaata aatatcactt      420
tctatcaaaa agtattttta aggccccagt caatggctgt ctactttaag gtgcattcaa      480

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caccacattt ctagcataaa gaacaaattt gacttactcg tgatggagtg ttctgccgtg 540  
 ttttcaggct agcacatttc ggtgatcatt acttaggtgg attcttttaa tctaaaacaa 600  
 ctcaagttaa gaatcatgtg ttttaattcat gccaagaac catatcttgt ctcaaggtac 660  
 aagtgtagtt tcggttacag tgaaactcag gaaaaaacat tgaagcagct ttagtgTTTT 720  
 taaaatacca tgctgagtga ctcatatct ttgatcacac ttgctgaaat t 771

<210> 238

<211> 644

<212> DNA

<213> Homo sapiens

<400> 238  
 gggagggggt cctgggattt cgggcaggga accgggcaca cgtgaggggt cctgggtagg 60  
 cgcttacgtt cctggtagag ggttctgggt tcgaggctgc aagccactc accccgggcc 120  
 tggagactag ggaagcatct gtgctggctt ttgtgtggag ctcaaggaga agctgggctg 180  
 ccccttctcc cgcccttccc tccctctccc ttgctcccgc agcagctcca tgggtgtcag 240  
 cgggcagcac gggcgctgc aggaagtcag gcgaggggtga accgaagtgc tgggggtttc 300  
 taggagggag atcgggctcc ggggttccag gtccctctta atccatcttc ttgaacgagt 360  
 aatgtgaaca acatcccaca gggcctctgg tgaggacacc gtggctcgaa agggacctga 420  
 agctccctgc ggaggggaag ggagaacaag gaggcagtga catgccgcca ctgtggtctt 480  
 cccttccgtc tttccctgct ggttggcagc cccgctgtac tccctaggga ggcctttccc 540  
 tcttagcacc ttcacgtctc acctggctgc gtggcgtttg cacctgagca cgcgggtaga 600  
 actcggctctg tgtctgtgca gattatgccg acaagcccct ggag 644

<210> 239

<211> 522

<212> DNA

<213> Homo sapiens

<400> 239  
 gggatattaa atgactgatt ttaaattgat gatttaaaag tatcatctat cctaacagat 60  
 gatacttttc ttgaacaggg acaaacaaaa taagatgtca ccttcatata aatgtttcat 120

gaatcaaaca ggcaacaggc taatccagca gaccccaaac ggacagacaa ggtttgaaag 180  
 gatccctcat caaaattata acagtgttta gtttctccag ttactcacca aatttattta 240  
 ctccagggtta ccattttcaa atatatataa ggctcttagg agtaatctag atatgacttt 300  
 ttaaacacca ttaactgcat tcatggtagc catttgtcat tttttttca ataaaagaat 360  
 agtaaaattt acttctgca ggggcaaagg ttgactctgg cataaaaagg gattttcata 420  
 ctcgatgact gaagtgtcc atatttgtaa ccaagtagaa actagacaaa aatgagaatt 480  
 attatgaaat ctttccaaat taaatatgag tgtttgagg aa 522

<210> 240

<211> 554

<212> DNA

<213> Homo sapiens

<400> 240

gggagagcgg tccagtgcc tgcataggag acgaggaaag cagccagagc cggcacaggg 60  
 cttggccaaa gccacacagt tgtttggggc ctctgggcca taaatcctca agtgctggca 120  
 agagatcatg cttaaagagag aagaccccag gctgtgtgga gggagtgggg acagcagggc 180  
 tatcctagggt ctagccgtgc atcataaggc tgctcagccc tcttaggcac ccacctcca 240  
 gtcgtccct gagcagggcg tcccctctg tctgacctg tgccatccca gacattcctg 300  
 agcacctac accatgctcc ataagcgggg ggaggggctg tccagggaac ccctaccaac 360  
 tgcattttaa agtctacagg aggattttac ttttttaatt ttgaaattta attttcttta 420  
 gagttagggt catgctctgt cagttcctac atggcaaacc agagctgagg cagccacccc 480  
 gaggccataa tgtcttttca tccaagtcac gatgatctaa tgtaattata aaattattaa 540  
 aagaagtact aatc 554

<210> 241

<211> 538

<212> DNA

<213> Homo sapiens

<400> 241

gggatagcct atggaaagaa gggactacat gtgagtatgt aatagttacg attgccatag 60  
 cgtctacatg acctgacaca gaccagggtt ttgctagaac tgctactgtt cattgacct 120

```

tgatgggatg tggagtggta tctatcattc cagttcacag atgagaaaat ggcagctagt 180
aagtgggtgga ctggggattt ccaccacagat cttctgaagt caactttgat gaactggata 240
gactaagaaa agcatgagac cctgcttgct ttcctaagag atattcaatg gtccaagtgg 300
agactgggca tcaatagtgc agtaggactt agagtttgag ttcctttcac aattattaaa 360
ggttgggtgaa agaacaaaag gtttttttta ggcagtgtaaa atttatcttt atttggtata 420
ttttatactt tttgcatatg gcgtaatatc tttgtagctg taatcaaatt attcccctta 480
tttctctgag gaaggctgga gaaggactat aataatcata ttttacacaa acaaaggt 538

```

<210> 242

<211> 477

<212> DNA

<213> Homo sapiens

<400> 242

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gggggtaggg gtgggatgct ggcctttccc tggagagcag gcaggacca tacgtagaag 60
tgacaagcaa ggtgacacaaa gctaaggacc cacaggctta aggagcaggc acatcgccag 120
ggcagggagt gcccgcccat cactgagacg gcgaagagac gcacacaggg ccctttcctg 180
tgtccacagc tgtccctaac aagggccttg cagaagggtg aggtcactct ccaaagaagc 240
atctccaact actcttgggc aaggccatct ctccagtagt cttacgcatg aggctaaacc 300
tcttctctta cctcaaagat ggcttcagta tccctcccg taccctcaac agggcaagaa 360
atgtacacaaa agcaacacac aggaggccac agtggggctg agaggacca ggtacacatg 420
ctgtttcctg cctggtttct cccacctct gccgtgtgtc tcaacgtcc tcctgga 477

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<210> 243

<211> 416

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 243  
 ggggccccaca ttcttgccaa.ctaggttgag tctggaatgt tgggtggctg tcaaacaatgt 60  
 ttggtgctgga attcagtga gacagatcat ttcatgcttt gtgatctttt attgaagaac 120  
 actttacatt ctctgccacc tcccacatat ctgatctctn nnnnnnnnnn nnnnnnnnnn 180  
 nnncttatct ggggatcact ctccctgtgt tctagggctt gtactcaggg ataacttcaa 240  
 agtctgaaat gtcttaagta gtaattaaga aggaaaacaa acgaactaag tgtttgaagc 300  
 agacattttt ggggggaaag aaaaatacca tcaacagtcc tatagaaaga ggaacaatgg 360  
 cttaagaaa aaaaaagaag aataaatgag tcagaaatag agaagaaaaa aatatt 416

<210> 244

<211> 516

<212> DNA

<213> Homo sapiens

<400> 244  
 gggatcttta atgggcttcc ctgggcagaa gcactgcaca cgttgctgca ctgtccttgc 60  
 tgggggaaac aatgtgctgt gtgaccactc atggaaggga cagagcatag tgacacctgc 120  
 acatggattc ctctattctc tgtgtgtgtc tttcccttt ataactctagc tgtgtgtctt 180  
 tattacctta gccaaacata ttaactatac accaagtccc ctgagttctt ctagtgaagt 240  
 tctgaatgtg agaggccatc ttgaggaccc ttgatatgca cacctaaaat gtaagggcct 300  
 cagtttatta ctctgtccct agtgcttaca tcattatcta gtacacagct gggtattgca 360  
 actatctatt gaaaataagt ttattttctt tcatttggct tcttccatta ttctaatgg 420  
 aacagagaag agtatcagtg aatggacggg ggacttttag aagcttttta caatgcacct 480  
 tgctatccaa cttataatct gcatgcctgt gtgtat 516

<210> 245

<211> 535

<212> DNA



&lt;213&gt; Homo sapiens

&lt;400&gt; 245

```

gggaacttaa attatttcga acttcattcg ggataactgc aaagactatg gtatactgag      60
aacttctact gccagatatt atgtaaaaaa ttacaattat taaaacacca tatttcacca      120
aatctaagac actgttgatt gtgacacttc actgttatgt accataaaaa gatgccaga      180
aagggagtct caaaggagaa ccctcaciaa aaagtggggg actaaacatc tatagtctca      240
atgagggata aaagcaagca actacatgca gaagggatgg caaagaggcc tgcgcacctc      300
ttccttgaca atggaaagag ggaacaaaaa ctccaatatc tgaactgaca accccatccc      360
tgcaaatttt gggggctgaa atcacactac cagcatcatc ctaaaaaatc ccaagcagag      420
aaattagctt aagcagaggc aagttggtaa agcccctccc ccagtgacca gcagaagaga      480
atgcacagct tctcagaaag aactcaactt ccgttaaggc aacagctgac ttaaa      535

```

&lt;210&gt; 246

&lt;211&gt; 488

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 246

```

gggatactgg agatgcttga tgtggaagac ttaaaatgcc tttattattt agtggtgatg      60
tgaggagattg ggaaggacag gcaccatctt ggcagatggc tcttcttcct cttcatcaaa      120
tgaactgtct atggtttaggt caatcacttc tactttcttg tttatggaaa tcctaaagta      180
ctgtacagac tgtgatcaaa tacaatttaa ggaggatggc acttgggcac cgatgagacc      240
aaaaaaggaa gtacatgaag tttctgcctc ttacaatgcg aaccatggat gctttacctc      300
cacattggat cattctgtaa cgtctcacc cagtcacata ttcttctatc agaaagtata      360
ctttgtatga caaaaactgt ttctgtacca cacattcttt gactttttgc atacttttct      420
aaaagtcatt tatcaaaactt atgtgaggtt ccaaaatatg taaaaatgat aataataaaa      480
aaagatta      488

```

&lt;210&gt; 247

&lt;211&gt; 623

&lt;212&gt; DNA

<213> Homo sapiens

<400> 247

```

ggggaaaagt ggcaggaaat aaagataaaa aggtagactg ggggacaggc tgtgaaggga      60
tttgaatgcc aggctaaggg atggaattaa tcaaaaaata acatgataac attggagggc      120
tttaaactgg ggggtttcat atgtatgtct tacaaaaact actctggcgg cagaatgaaa      180
aggagttagc agtgggttaag atcagagaag gaggaacacg atagtaagtc actacagtag      240
cccaaaggaa aagctaaaac actagcaata ggatgaagag aggagggact acaaagatgt      300
ttaggaggca gagcctacaa aatctgatcc tgagcacaaa accccatttt agtcctgtgg      360
gctaagaagc tacaaagaat gacgggaaac actctaactg cagggtttgc aagtactatc      420
ccccgcctc accccccctt cttttctttg ataggcagaa ggaaataaaa taaatagacc      480
cttgaatctg ttagctccag aaaaatgcat gaatctgaat ttctcttact agctgggagg      540
cttgactgct gagagtgcta tactggtgaa aatgtaggtc agccaagca ggcagcagtt      600
ctgtagtgct ggctctgaac ctg                                           623

```

<210> 248

<211> 649

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 248

```

gggtcttggg gatcttttta tctaccctgg tgtctggcaa gcaacaaaca aatatcatca      60
gcagaaagcc aggctcagct gagatcatga gagcccagga agcagttata tcaggagtaa      120
caacctgggt cacagcaggc ccaggaccct ggaagctgag ctcccctata tgggaaagga      180
agaactaaag ccaaacttca agtgcccnnn nnnnnnnnnn nnnnnnnnct gagaacctct      240

```

gtctgtccct tctcctgcaa agagaaggac acaggtggga gaggagcatg ggggtgggaac 300  
aaggtcagac ataggcctgt ggtgggttga tctgttccat acctaggatg gggactggag 360  
cctgctcagc tttcaccttc cagcgttacc tggagcaacc ctgtggggag ctgtaggctg 420  
tccccataga cttctgagat gtctttcttt ctctccatct gcaggaagat gtcagagccc 480  
cagtcttttc cctaggagag gcttccctag atgggtgggag tcctggccca ggccactgtg 540  
ggttttacga agttgaaggt cctgggtcgg tgatggcaca ggggcacaca taataacttc 600  
ctgcctttca gggagcacag ctcagctcca cagcaggaca cctgagcag 649

<210> 249

<211> 520

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 249

ggtaatcaac tttacaatac aagcattctg agaataacag tgttaaaaca ggttatttcc 60  
ctttagtcaa accttcacgc aaatttaagt atccattcta tttgattctc tgtacaaaaa 120  
atatgataga taaagggaca gaataactt accaggagcc aataacccaa cggctacta 180  
tcataatccg gcagatctgg agcaatctta caagcttgta tggtcaggta tttaaatatg 240  
tggtactatgc cttttatata tatctaaata aagtcacaca gatgtagcca aattattact 300  
catctgaagt atgctccttt ttatcatatc aacattttat gtaacatata ttgggaaagg 360  
gaggcatttc tatcaagtac atacagtgnn nnnnnnnnnn nnnnnnnnnn nnnnnnnngg 420  
ttaagtgtta ttttaggtgt ttaactggta aatatgtttt cattttctag tcactaatac 480  
atttcagtaa tatataaata aataactttt gattatactg 520

<210> 250

&lt;211&gt; 632

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 250

```

gggagaaaaa gtggcaggag atgagggagg acaggaaagt aggaaccaga ttgagaagga      60
ccatgaatgt gatgccatgg aatttggatg gtaccttgaa aagtggtaag gaagccattt    120
aaaagatttt aagtctgagt atgatgtggt ccaatttaca atttagattg ctggggcagg    180
aaggtggatt tgggtggttc tggcaatggt tgaggaatga aggaagaggg gaggaatgga    240
agggagggtt actgtaatta ttagataact aaaatggtct agcaggatat gactgaactg    300
gggcagggtt agcggagatt acagagatac tgtagaatg ccttcttggg tttggaagta    360
gagaaaagaa aacatagtga gttatatatg taatcattaa tgtacaataa aggtaacaag    420
ttccttcttc aaagtataaa agagacgagt ttggaaatgc aagtatttcc tccctctgtc    480
tttcaagata acataaaaac tgcagcattg aacaatagta tgtattcatc atgaacggct    540
tatgtgcttc aagcatagca cctataggta ctgaataaat gtgggttata tgtgaacatg    600
atatattatt aaacacatga aatggactgg ac                                     632

```

&lt;210&gt; 251

&lt;211&gt; 670

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 251

```

gggtatagct ctgagagaca gtcacagccc acacagggtg gccagggagt cagaccccaa      60
acttacagtc ctgcagacct cactgtgaga ccctcctgct cagggactgg caatgccag      120
gcagaaatag ctctgctgaa cacatataac actagttgaa aataatttgg aatggtttac    180
gctttgagga cagctataga aaagcacagg gtaaaatata gccttctgct tagatttaga    240
atcttgcaat ttctaagagc ttctgtctt tttattctaa aaagtcacac ttcacattca    300
aaacattatt tcctaaaatt atcagctggt ggcaactttc cagaaaagag gcctagcttg    360
ccatctttct atagtcttct tacaggcaaa agtcaagcct gcctgacatg caaagcacct    420
tgacctctga cccagagct cccagggcc acatgcctgc ccagagccaa ggacctctt      480
atgactctgg taaaagactg ggaaaggcag ggaagggtgcc aggggctggg gaagttgggt    540

```

cccttctctc ctctcccca ggtgactctc agtcccaccc taagtgatac taggggctgg 600  
 ggaagttggg ccccttctct cctctccccc aggtgactct cagtcccacc ctaagtgata 660  
 ctatgggctg 670

<210> 252

<211> 684

<212> DNA

<213> Homo sapiens

<400> 252

ggggagtgcg ggacaggctg tgaggaccca gagaatttgg gaggagagga agagggcaca 60  
 gaaggactgc ttgcaggctt attttgcagc tcacaggaaa ggacaagaga aatgcttgga 120  
 atttgcaatg gctttaatgg ttgaccttat gttaatttca tcttactcct aacttaagct 180  
 tgcccatatc caccatggct ctgacctctt tgcaatccct gtcccctctt cagcttgagc 240  
 tctcacttct cagtgaccaa ttgcctacat aattctcatt tcaacttgtct cagagcgaat 300  
 acctgtatct cccagtcctt tagctttttt ttcctggaag ccatgtcgca gtcttggtat 360  
 cctctggttt agttccactt cagtcaaatg aattctcttc aattggctgt ggcctaaaca 420  
 gatttatctc agatgacaca aataagtgc cctggggatt ctacttcttt ggggacaatg 480  
 agaagaacaa ctgcttttag aaggatctga aagtatgctg ttccctatat taaaatgcct 540  
 tgtgctctaa ttttttaata ttaaatagaa ccaaaaatcc acaatgctgt agtttctaaa 600  
 tgggtgctct atgagcatca gaataaaaag gtatcctaaa cctcccaccc aactcatggg 660  
 ttcattattc tcaaatatct tttc 684

<210> 253

<211> 677

<212> DNA

<213> Homo sapiens

<400> 253

gggggctcat gtggcgggcc actgggtggg catctcgccg tgtgcatgcc ggcaccacag 60  
 aaacacaagg tgcagtggac agagaaacag gcagcaaggg gaagtggctg atgtttgcca 120  
 gggcactggt gggggccttg gggccagggt ttgaagtctt ttctatgaat gacaaaacgt 180  
 ttctggggga tgatgtcgtc acttgctggg agcagagtgg ggctcgtggc tggttcgggg 240

```

cctgcctccc aggtccagc catcggttaa caggtcgagg atgcttgtcc cgagcagggt    300
gcctacaggg tgccaatgac atttacaaag aactgttctg caacagtcta ctatgaacat    360
actggaaggc tggacaggca ggggacgatg gacagaccgc agcttttctg caggacgtgg    420
gcagagctgg agaggcccta caacgttctg tgccactgcg gtcacctcca tcgtactccg    480
ccttcccctg ccaccacagg acctggatgc aaagacaccc ccaaagacct aaagtgtggg    540
tgagatggac aagtcatggt gcatctgaac aaatcagccc gcagcgatca gatactatgg    600
gctggctcgg ggctgctgtt agggacaggc atacctgaaa taaaacaaac aaacaaaaaa    660
aaacaaggaa aaacccc                                     677

```

<210> 254

<211> 572

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 254

```

gggagcetta gcctgctcct ccctacccat tacccaatgt aagttgtaag gcaactgttg    60
gctagaagaa aggatctcaa ccactgttt ctgccctcac caagccctgt cttgctagcc    120
atctctgccc tcaacccttc ttagtctctg caatgttcag tgaaaactcc ccagacacag    180
cagtttgctg gtgtgagggg agaggaagtc ccaaggctgg ggctgggcca ggtgggacct    240
ggtgctttgc aacagcatcc catttgacca cagttagggt ttgaccctga tgggaggagc    300
agatggaggg aggcattcagt ttaaagtggg gaagtggaat gggnnnnnnn nnnnnnnnnn    360
ctcagaagga ggctttcagc ctttccttgc tagttcctgc taactgtctt cttgctcaga    420
ggagggtagg gaagcatgtg tgcaactggg ttgggaggtg ggggtggatgt caccaggcag    480
gggtgcattg atttggtgaa gaaggcagca tatgaggcct ggcagtggga cagttggagg    540

```

aaccatttt tttttgtttt ttgtttttta ac

572

<210> 255

<211> 674

<212> DNA

<213> Homo sapiens

<400> 255

gggggtgtgg acgtgctttg ggggaggtct ttaagtctat tgtttaactg taccatccag 60  
agcccaccag aagctattga tcattaaaat tatgagaatt tcaactcccg ctgttctctc 120  
tttccatgac tgcccgcagc tgctgctgca catctgctct gggtgggcgc ttgcacatgg 180  
aaggagcagg tgccatggta gccacctgc cctgctccta gctgcggccc agtgttacca 240  
cttacagcga cgacaagcct agatccaagg tagtcctggg gccaaacccc gccaggagc 300  
agtctcctgg ctcaccttgg cctcatcatt ccgaaggcca tcaactgccac catgctgttc 360  
aggaacatgg taggataagg tgacgaggct tggaggcctt tgggtgtcca cttgagttca 420  
cgtggggaac tctgggttcc aggategctc ttcagagatc tgaacacctg tgttttcttt 480  
gaagcaccaa aactcttctc actgtggacc atgagtttat taaccattg ccttaggctg 540  
acagaagagc cctcgagcga atcttggaag caccacctgg cctcagtgtc cgtgttcca 600  
caggagccaa gccggtgctt ctccctcaca ccagaaggta gactgtgtca cctgccacat 660  
ttcctctaag gcag 674

<210> 256

<211> 649

<212> DNA

<213> Homo sapiens

<400> 256

ggggctgggt cttccatact ggaaggcagt tgggttctac cactagggga ccattgtcac 60  
tctgcctctc tgaggctcag tctcatcctc tgatgtcatg ggccatgact gccaggctc 120  
cttcagcac ttcaatgccg gggaccaata tgtgagtagc agaggacca tcgctgtcc 180  
ccccacataa aagcacatcc caatagaaag acaaaacatt acaggggcca aacactacca 240  
gaagcaagtt taacaacttc gtgccccaaa gcccttgctc ctcccagct taactaccta 300  
ggatatcaacg gaagagaggc aagagttgtg ttaagacact ctccattcaa agaacaaaat 360

ggtgaaagtc ccaaagagtc ctgttctcta gtgacttgta ggttcgtgca taaaacgaag 420  
 actgtgggta catacaaagc cttatgttcc agaaggactg ataatgaagt aaggaaatgg 480  
 tgctccagcc atctgtgtta ataagcactt ggttttcaac ttgatcatta tcttatggat 540  
 aaatatcttg caggcagttc tgtagttttc attaggggat gcttaaggca aaaggtagct 600  
 catgggtctt aactctgtgg tcaactgtgc ttatathtag ccttacaaa 649

<210> 257

<211> 667

<212> DNA

<213> Homo sapiens

<400> 257  
 ggggaaagg gttgaaatct agcaggtctc taaaacagag actccagagt tcttttgaag 60  
 agacctgcaa ctgaaccatg agtcagaaga atttaaaatg atttgtaat aagctctgag 120  
 aataggtctg gagatttcaa gtgaggcatt tgcaaaacaa gatgggaggg agcagactga 180  
 agcagggacc ctgggaaacg tgaggcacc tgggagaagt gggggaccaa ggaggaaagg 240  
 agataggcag gaaactcttg gctcctgtca atcatcaaaa ccatggaaag tcccagaaag 300  
 ggtttatcta ctctgttaat tcatgctgct aattaaagat tccagggaca gattgggatg 360  
 ggataaacag gggagacggg aggggactga tttttaaatg aatgtgcaga aaacaaaaaa 420  
 atcccaaatt tctctctctc attccacca caaatatgcc tctcttcata gttcagcaaa 480  
 ggagggtaac ttctatcagc tcatgaaact catttccac tggactgact gtaaattcaa 540  
 aattccaaga gtgcttcaaa tgggtaagtt actggtgata ttttaagtac tttttaaata 600  
 aactgctcac aggtggggaa gaaagtttcg gtgcaagatg ctttaatgac ttggaatacc 660  
 ccattct 667

<210> 258

<211> 650

<212> DNA

<213> Homo sapiens

<400> 258  
 gggagatgct cacactggca cagcagaaca gtggggaaga ctcagggcaa cggcaacggc 60



```

gggagtgggg cagctgccga gtaaggggtg tgagaggagc gtacagacac gtgtcccgtg    120
ctccagtagc tttagaatgt cgtgaatagt actccattca cgcctccacc tgtttaaagc    180
ctgtgttagt tatatgtgtc ctgtcatgtt gtctgctttg agtcttagga ttcaatgagg    240
aaacctcgat tcaattttct gtaaacttct gtttgggaaa tgctttctga tagtgacggc    300
aatggaaata tcaagcaacc aagggaaatc tgaagatccc agagagccca gcaagcagca    360
acatcctcga gttaggcaag caagggcccg gagctggcca gaccatgggc tggaatgcag    420
tgggggcccg tcagaggggc ttcttctggg gtcctgactg tggtttctgc cagaggtgga    480
gcaagttgga actggatgtt gagtgaagtt tcaaagaact tagaagtcaa atggggaaca    540
ataatcaaag gcttccattt tgaagctgaa acaactccaa attctgctgt ttcacttagg    600
ggagaacacg agcaccatgt cattatttta gtttatggag ctgctgttcc    650

```

&lt;210&gt; 259

&lt;211&gt; 630

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

```

<400> 259
gggatttcca ggaaattttt cactctgttt taaaaatgca gtatatctgt ccattgcaga    60
ctgcacatct ctacggtaaa ctgttcgaag aatgaccatg acgggggtcaa actcttgatc    120
ccagacttca gctttgggag tatacatgcc ttgttgcata gaacctccag gttcaaaaac    180
aggagcctta aaatcagcta cagctgataa aactgattca aagctgtaac tgcctggaat    240
aatgccactt ttgggattag gattttctgg aatgagggtc agcaatgaac tgtgtgtcct    300
gtcattcata cacagctggg ctaccatctc ggccctgaga atctcatcat cagacattcc    360
taaatgtaaa cgaagactca aaagaatcac aagaaatgta agagcgctt ctaacatoga    420
cctctcatgc tctgcatcaa gtactgtatt ttgatgttgt gatgccattg tcaacaaatc    480
cactacctta aatctttcaa agacggatga aataaaataa tctgggtcaa gtctagaagc    540
acaaaccttt aaaagaaaac aaaatgcttt atttctcaat attcagtttt ccttcttcta    600
ttaatcatgt tttctatac tttttttgt    630

```

&lt;210&gt; 260

&lt;211&gt; 705

&lt;212&gt; DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 260

```

gggggttgcc cccgcagcac cactggatca gtgcagcata ctcagagctc agagtgagcc      60
tcttttctca agcagaagat ccagagcaaa tccatatggc cagttctggc caggtgcccc      120
gccctgaacc aatcacaggg atttctactg cccagtcctg gtcacatgc cccacccaaa      180
cgacatgaac ggagcagggg aaggatggag aaggggaggcg ctgttatgag aacaggagtg      240
gatgctggag agnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn      300
nnnnnnnnnn nnnnnnnntc catctcaaaa agaaaaaaaa gagagaaaag aaatctccag      360
gacactcttc aatgccccgg tgccaggaac agaggacatc ctacggtcca caccagctcc      420
agtgtccctt ggcttgccac gtaggacac taagactcag aggatgccag gagtggcccc      480
agattacaca gtcttcagag cccaggggtc ctatgtcccg tgccaccaac tctctggtcc      540
ctcccagcca tcaactggtg ctggtgatac agcttctgtg caccacaaag ctcagacaca      600
tgggctctgt acctcaagag ataaagacca gcccaccta agtggccctg cccaggatca      660
ccagccctga taacaagact agctgggcac ccggggccagc cttca                        705

```

<210> 261

<211> 483

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 261  
gggacaagct ccagtgtaaa gacttcaagt ggttcttgga gactgtgtat ccagaactgc 60  
atgtgcctga ggacaggcct ggcttcttcg ggatgtttct ctttgagtgg ctggctaatt 120  
cgaattggga tccaaacaag ctccagaaca aaggactaac agactactgc ttgactata 180  
accctcccga tgaaaaccag attgtgggac accagggtcat tctgtacctc tgtcatggga 240  
tgggccagaa tcagtttttc gagtacacgt ccagaaaga aatacgtat aacaccacc 300  
agcctgagnn nnnnnnnnnn nnnnnnnnag gaatggatac ccttatcatg catctctgcg 360  
aagaaactgc ccagagaat cagaagttca tcttgacgga ggatggatct ttatttcacg 420  
aacagtccaa gaaatgtgtc caggctgcga ggaaggagtc gagtgcacgt ttcgttccac 480  
tct 483

<210> 262

<211> 508

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 262  
gggcggggag aggaattgag gcagaaggta aaagctgtta ctaagggaaa gagccaaacg 60  
gttcggagca gccaacggct cagacactca aactgggga gagaggaatg gggaccagcc 120  
aggcaciaat gagctcgcga ggccnnnnnn nnnnnnnnnn nnnnnnnna ggaggggaat 180  
ttccttgtgc ctccattccc gggagggggg agcggcggtg gaggccaccg tttccaggct 240

tcttcaccag tttggataat aaggccctcg tgggtgtgttc atctacttac ctgaaataac	300
ttggaataaa taatttcgat tacacgttga agatacaatg agtgactgtt tgggttttcc	360
agtgtgattc attttcattt ttgttaaaat aagacccatg ctacattgat gtattttagt	420
aatgccgact tcctgggatt gtatgttctc accattttta tagtttatag tctggggaag	480
tagggcacct ttgtctcccc gaaaacat	508

&lt;210&gt; 263

&lt;211&gt; 464

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

<400> 263	
ggggcttaga taatagattg aagctgccca cagaactgag tgatgatacc acccatgctg	60
cataaagctg cccacaggat taagtcacat tagagataca aagcacttag ctcaagggat	120
ccaggctgca ggcactcaat ctattatcta agccccttgg ctgttctgtt ctaagtctac	180
actgaagact agtttatcca ctgtcctctc tgagtttggg acacttgagt ccttctttga	240
ggcccaggca gtttgagggg ccaccctaa agctgatgtc tgaactctag gccatggcgc	300
ctgcccctag gtatgatgcc ttgtggaact gggaacttct ctctgctact ttcactctca	360
ctttaattgc tagaggggtga taagaatccc aagccctaga gatgttatat ttatagtcag	420
taatgccact ggctccttca aatttttgc tttggcagaga acag	464

&lt;210&gt; 264

&lt;211&gt; 574

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

<400> 264	
ggggttagac aggtaccggt cagattacgg tggcacaggc ggcgtggggg tagacaggta	60
ccggtcagat tacggtggca caggcggcgt ggggttagac aggtaccggt cagattacgg	120
tggcacaggc ggcgtggggg tagacaggta ccggtcagat tacggtggca caggcggcgt	180
ggggttagac aggtaccggt cagactacgg tgacacaggc ggcgtgcggt tagacaggta	240
ccggtcagat tacggtggca caggcggcgt ggggttagac aggtaccggt cagattacgg	300
tggcacaggc ggcgtggggg tagacaggta ccggtcagat tacggtggca caggcggcgt	360

gggggtagac aggtaccggt cagattacgg tggcacaggc ggcgtggggg tagacaggta 420  
 ccggtcagat tacggtggca caggcggcgt ggggtagac aggtaccggt cagattacga 480  
 atgcatgttg acgctttcag ttcacccctt tctttgctaa ctttcttcct attttcttct 540  
 aatgcgagag cttattaatt ccatatttat catt 574

<210> 265

<211> 486

<212> DNA

<213> Homo sapiens

<400> 265  
 gggatgaaga gtgagacagg tcttactga tgaagcctct tccctcaat ctaaactaga 60  
 tgataaaaca ggagcttctg gctgagcgtg tgaggcagta aacacacaaa agcatttgtt 120  
 ttgacacgtc tggcagaggg gctcaactca acacagcaa cactcctgca gatgtccgga 180  
 gtcaagccgt tctccagac taaggccctg cagtggtcag cttggaccct agcagggcag 240  
 ttgagggctc gggccccagg gccacagaga cttggcttca caccttacac tcgggaacca 300  
 cacggcgatc ttgggtgagc gacagaacaa gttactctct gaacccagc taatagaatg 360  
 ttctttatgg ggaaatgagg tgaaatgaga cgggtgtgaca gagcatttac acacatggaa 420  
 acacatagga agtacaggct cttgatgctg ccattattat taatcatatt ggtaattttt 480  
 tttttt 486

<210> 266

<211> 460

<212> DNA

<213> Homo sapiens

<400> 266  
 gggagagagt atgttagaaa tcaatggttc atgactgggg ctcagctcga taatcagaaa 60  
 catttattat gaacttatca tgtgccagca ttaaattgtg caagatccac taaaagccag 120  
 ccaaataatt aacaaaaagc acatcaacag aagagataaa cagaagagat taaaaacaca 180  
 aatattctca atgattctca ctcaaaaaga ttctagaaac cataaaatgt ataagccact 240  
 ataataactc agaaggcagt gtgacaagaa aaaaattagg attaagcatg cagattaatg 300

gacgtatttg aactggaaat aatcattttt agatatcctc attatcaaac tatatgagtt 360  
 accattatat caagcagttt gagaaaaaca gatgatgctt actggagcat cactgagggtg 420  
 caaagacaga gaataaggct gggaatcaaa aacttcagct 460

<210> 267

<211> 449

<212> DNA

<213> Homo sapiens

<400> 267

gggccgtggg ggagtgagtc ccctgctgtg agaggaccct agcgtcacct ccttagccag 60  
 ggcagctccc agggcctggc ttccttgctt tctccttgca ggtccagatg ccatcctgct 120  
 tccccctcag ttttagcaggt agacattact gacaccattc cacaccaggt ctgggctgag 180  
 ccggcgggga caggggcagg gtgtactcag atgaatgagg cacagtctgt gcctctcaca 240  
 gccagatggc agaggcagac acagaaatcc atcatttcaa catgaagtgg cagaggggag 300  
 atacggggcc attggggctg caggaccag cctggtgggc agcggcagct tctaggaggg 360  
 atgcatttcc agcaaggcaa ggtgaaaaca gcattgtagg caggacataa aagcatagga 420  
 actgtgggaa tcttaagcag ctgagttca 449

<210> 268

<211> 521

<212> DNA

<213> Homo sapiens

<400> 268

ggggagggga aggggtgattc aagagaaatg aagcatgaga tggaaaccat tgagagctat 60  
 taagaactta gatttgatga agcttgagaa ctcatgggcc atctgggggtg acagggatat 120  
 aggagcgag tccaggtaaa taatagccat cgactagcag tgaatttagt agaaagagca 180  
 agttaatcct gatgtataac cagccctgac tcacttcttg ggccagagaa aaaaatattc 240  
 attgataatt taatttctac atttacaat attacctcat tcatgtcctt gcatttcacc 300  
 tctttccctt ataggtgatg tcaaggtaac ctaacacttt ttaaaatctt cttaccaaatt 360  
 ttacattaat tcaaataaag acttgaaatt tgtacattat taacgtgatt aattatgaca 420  
 tttccaaagc ttgatttttt tctttaaaga ctactttcta ttagatagct gtatatattc 480

caattacaca ttacttttaa atgtaccatt ttaggagatt t

521

<210> 269

<211> 557

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 269

gggaaatgtc ttaaatagact tccaaaatgt tttgtaagaa atatctttat aaatggataa	60
aaatagacct gcttgctaac aattacttgg taaaacagca ctcatTTgtt tgtacattta	120
gctaaaagat taagcttatt acottataca cacatataca tcaattttgt tgttactttt	180
ataaaattca gaaagaagaa gaaaaggag aagctcctat tatgttttaa attaactagc	240
cttgcatTTg taatcgcatg gtcttacctg catatgcata catgtgaaat tctaataaga	300
tagacttTgtt ttcatttaca aatatctagc agtacatata accataacnn nnnnnnnnnn	360
nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn gtactacaca attagtagaa agcatatttt	420
agagacacgc ctgccgcaaa atactcagtc aagggtttac tgtcctaccc tctctaggct	480
tcagcctcct catttgtaat tcatgttaac aactacagat aaactccaag gattcttcag	540
cttttaggga tgagaga	557

<210> 270

<211> 550

<212> DNA

<213> Homo sapiens

<400> 270

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gggggtgggtg gccagaatgt cttcccttg accaaggacc taacacctaa gactggtggc      60
acaaacacaa catccttggtg caggaagccc aaacctgcc ggctccatgg gtgaagccat    120
gctttgaaag gaacagggtc acccttgctg taatgtgctc ttgggaagtc atctgccac     180
tctgctctga gcaggcactc gcttacctgg ggcaattctc tctgggggag gtggcgggag    240
ggaacaaaag ctctggctga ctgagcacct gctacacacc tggcccaggg ccatacagg     300
ggtactgggt caccgtccca ccttcacagc actaacgtcc caccttcaca gcactaacga    360
ctagagaagg agggaggggc tcgttttggt aaagaaacaa aaattattct acaagttcag    420
aggaaggaca aggttccgtg tctggtcaag ggtaggcttc aaagacgtct ctggtcaaag    480
agtccctgag agctgggcct gacagcctgg acacacagag gaaggtcaag tctctgggat    540
gctgtctgag                                     550

```

&lt;210&gt; 271

&lt;211&gt; 665

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

```

<400> 271
tctggagctc caccgtgggtg gcggccgccg gaggagtcca tttcagatgt gcttaccttc      60
agctcattct ccagcgccat ctgctgatt ttctgatcca gcacgcggat ggggaaggtc    120
acctggctct ccagggagtg gcagaggggtg aagaacttct ccagggtggtt gtcctgggtg   180
tgtacagaag aaacagcttg cacttcaata ttaaatactc ccttatgtcc ttcagcccac    240
ttaatgggag gattctgtaa tgggactttc tcagcagaat gcatggagta gttgggtggc    300
aatttttcca aggcaactgg gagacagtag gatccagttt gaagacgttc atttaagaga    360
attggcagcc atgaatatcc caggagagtt tccacggagg ctcccttgctt ctgctgacag   420
ctgatatggt agaaggtgaa caggaggtgg tgatttactg tgagcttagc ggggagctta    480
attttcactt cttcataaaa gtcacgagac ttattatggt atgtaacagc tgtgtacact    540
tctgcagaa attcaggccc gctggatttt ccaaagatga ccggcatcgc attgctagca    600
tcttctccac acataaactg gatctttatt ggaatgttcc gggctgatgc tagtttggtt    660
acaaa                                           665

```

&lt;210&gt; 272

&lt;211&gt; 596



&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 272

```

gggacagcag aaaataagga tgagttcagc taaaagtaat agaatgccta atttatagtg      60
gcttgatcgc tcattttctca ttctgacatc cttaacaaca ttgccaggga gcccgttatt      120
aatgtagatt atcaggctcc acttcagccc tgcaaatca acattcccat tgtaaggaga      180
tttccaagcg attcataggc ccattaaact ctggtctaga aaacagagat acttagatat      240
ctcacagaat aaggatagga atgcaagcag ttccagagtg gctggatcta aatcaccaat      300
aacaggcttt tgtctcattc cactttgcaa tccctagcat gttgactttg gccttttggt      360
gtgtggcctc aggattccaa gatggctgct gtggctcctc gcaccagtgc attctaggta      420
ggagaggagg ggcagacgtc ttctaataac tcattggcca gacgtgggtc acatgttgac      480
tttttttttc tcttttaacc ttctctatgg tactgaacat gttgactttt agatgactca      540
cttgggaaga taaaaggatt aacattacta atttatacat tcattcattc agtaaa      596

```

&lt;210&gt; 273

&lt;211&gt; 681

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 273

```

gggtctggga tggaactgca caaatagtga aactgagtc agaggaatca aaggcatcct      60
ccatcaagat tctccaagg agaaggaaaa ggtgggcaga aagaggagtt tcctaggaga      120
gccaccaggt ggagccacca ccacaaacc acttcatggc ttgtcctctg ggtggatttg      180
ggcggacacc agcaggagta tggcgggagt cttaaaccca tgactaacc atgggagact      240
cattagtgtt aatgccttga aatcagaaga cacagagata gaaaggagat taaacataac      300
agaaaaaaaa atctaaaaac cgattttatc aatgaccac acataatcgc aacatgatgg      360
ctataccctc ctatgtagtt cttaccatgc atttcaccac cctcactct aggctcaata      420
ggttcagaaa ataacatgaa aaagggtaac acacactcca acatcaattg ctggtgctaa      480
caacgcagtg tccaataaaa acttgccaga aatgcagtca gggatcagtt agtttaaaag      540
acttctttaa aggctcttga ctccagagct ttgagaatg aaggcccact ggaaaataag      600
actatagatg cgtatacaga tacattcaca cagacgtata tattactgaa tgactatgta      660

```

tcatatctat cccattcac t

681

&lt;210&gt; .274

&lt;211&gt; 646

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 274

```

ggggtttagac aagcttgctg tataccttaa ggcaaattta atgaaagcac cactgaacga      60
tgaattagtt cactgagttg attgagaatt taatcactca aaagcaaagc ccagagaaat      120
tcaagtcagt aagatacaag gcaatttttc ggtcttaaata aactaacagg tagcagaata      180
ttgagcattt gatattttgt cctggataca ttttttatat ttttaattca ggaaaacata      240
cctaattggtg gacaaaatat ataattctca tacacataaa aatatttata aaagaaaaaa      300
tccacttgga catcctttga ttttctatcc taaaaatggt tcaagttttg gaatcattta      360
tctactattt aactgtagca ttttacatac agaataattct ggtatctcaa aaatgttaat      420
attttaaaag ccacaaacc aaagtacatt tcaaaccat aaaactttcc tgatgaaata      480
cttttaaaat gtcattttta cctttatagc attaggcaag cctctaaaat aaatttcagt      540
gtaataaatg acctttcttg taccactttt tgcttctttt acttaacata gctaatttaa      600
acttggcact ggtgcaatat aattcaagct aactaccatc aaaagg                        646

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&lt;210&gt; 275

&lt;211&gt; 631

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 275

```

gggtctggag tccctagtct ttgttgatat cttagctgtg aaggtgaaaa aatagaatta      60
aagatatttt ggcagattat aagcttcgga aaaatgaacc actaaacaag ttattttttt      120
gaactctaaa agaggaaatg taaatgtttg atactattat cagcctcaca gtactttcca      180
cttactgggt atttgacata tagataagca cgtgtatgag tatgcacacc cacttaaatt      240
acgatgggtat ttaaggtagc ctcttcatct acttactggt ctcttgcccc ctaaacttag      300
agaagactaa gagtgaccaa ctgtggaatg aggatatttc aaagaccocct gtatctagcc      360
ttcttttcta ccccagacc ctggtaggggt ttgctaacac caactccagg gacatatacc      420

```

agaaaaccag tgtttctttt tagatattgc cagcttccat tcagccctcc cctttgtata 480  
 aacaagggtta aggaccatct tgtattcatc tetgactcca atagtgtctg gcatagtgtc 540  
 ggtacttatt caatgcttat taaacaaata cattgcaact cacttttgac agaggctgtg 600  
 ctctgtatit ctcttgagtc tctaacgttc c 631

<210> 276

<211> 659

<212> DNA

<213> Homo sapiens

<400> 276

ttacagcaat cttgttacat tggcaacaag aaagccatcc aatgagccac ccagtagtta 60  
 gtcaaagtgt agtaattaat tcacgctttt cttgaagaaa ctcaaagcaa ctactactc 120  
 cagtttttta ccaaattccat ggaagaagag gatcatcaag aagccttaat ccttttgggt 180  
 aaatggaccc actgagaagg ggagagtaac ttgtccaatg tcacgaagcc agcctaaggc 240  
 aaaaccaggt acagaactca gactacccaa gccggtgccc acattagcac tttagaggga 300  
 ccgatatata aaactctctc aggggagcta ggcacagtg cacctagaca gcttcaccag 360  
 caaagttttt aaaggaggtg gagaacgagg cttgctctaa tagcagacaa ccaactcctt 420  
 ccaatcagaa gggagttaaa agtagtgta gcatatggaa aatgccaatc cacctgttcc 480  
 atcttgatg agactgacca ctcaactgac tgcttgctga tggtaactga ccacagtaag 540  
 aaggattctt gtgtctcatg taacgctcct ctcccttttt ggtagctctg agctgaaagc 600  
 ttctctcccc atgcacggca atggggaaac caaggcacc accttcaggg ataccctg 659

<210> 277

<211> 457

<212> DNA

<213> Homo sapiens

<400> 277

gggtggcgg accggccccc cgacagtcca gctcctttcg gctcttgag gaagccctga 60  
 acgctgagga gagagggtgg actcctgtct tcttgcccat ctaactgat cccagtcct 120  
 ccctgcccgc ctccagggcc ctggccaccc ctcccaagct ccacacttgt gagaagtga 180

gtaccagcat cgcgaaccag gctgtgcgca tccaggaggg ccggtaccgc caccggggtt 240  
 ggtacacctg tgcccactgt gggctgaacc tgaagatgca ccggcgcttc tggcagggtg 300  
 acgagctcaa ctgtgagaag aatgcccttc aggaatacta ggttcctgca accctcacct 360  
 ctggggacga agaccctcat gccctcagcc tgcctcactg ctgggccagg gtcatgccta 420  
 tataagttgg catggcaggg acaatggtgg gcagttg 457

<210> 278

<211> 720

<212> DNA

<213> Homo sapiens

<400> 278  
 ggggatttta gataatcatg gctcccacgg tagttttaga aaatgtggat actgccgcct 60  
 ggtcttcttc ctagccattt tgagtttgct ttccagcttt tcgctggtgc ttcatactca 120  
 ctttttgac tggcatagcc ttttgtcaac cgtatttcca tttacttctc ctagtccgtc 180  
 tttctctttc acttgtggtt ttcttccctt gtcatttaag cattctcaac tgcacataga 240  
 aatccaacag aagccttttg tgtgggggat tccctcagtc ccaggcagtc ctgaaagcag 300  
 caggtgtctc tgcaaaggct tctgtcagac ctagactta taccagcag ctgctaattcc 360  
 tgagctctca ctcttaaaaa gcagtaaaat agacttcagt caaaaacaag tatggtggga 420  
 gttaactccc tcatcttgag ctcaagccac acttgccttg aaattttcca aaaattcact 480  
 aagctaattt ctctcactat ggaaagagag aaaggctatg ttgctggtat acaatgctgc 540  
 ctgtgatgga ggtggtgagg cataaatttc cctaactgga agataaaggc taaccacgta 600  
 tgtgggtgat gggggttga ggtagcttcc agggcactgg agctacaagt agaagcacia 660  
 attttcctgg ctggaaacag gccctagag ggaaacatca caccagataa ggaaataatc 720

<210> 279

<211> 708

<212> DNA

<213> Homo sapiens

<400> 279  
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 ccctggtccc ctggatgtag gctggcaaat ctcaggcctg tcatctccgc cttcggttta 120

cctttccgaa ttgccctgg ggaatcacca ggtcggggca gcctgtagac gcgaggacag 180  
 gctgttggga gggaagtgga agggccctga aaagtcacca gtgttccccg tgggtggctgc 240  
 gcacgttggtg gtctccgtcc gtgggctgtt ttttccatt tactgcagtt cctgggtccc 300  
 aggtgtcagt gttgcagtct ccaaagtta gctccttttc tttctttcag aattaggaac 360  
 ttagctgcgt atttgatttt gcgaattagg tgatttgtaa cttcagcgt tactgatgac 420  
 taagtgttta tgcaagtcc attttgtcct gagtaacagg aatggcaaaa gagccatctc 480  
 tggaggtttt ttgaaatgac cgcttgccca ggcgtgttac gcagtttcat tgcagcctgc 540  
 gtgggtctga cttgcggtc actcatattc tgcgaggtcg attgaccac gctgaaacat 600  
 caagtgaata ctggccaaca attggtcccc agactaaaag ccgctgctgt tactcagttt 660  
 ctttacctgt aaaataaaag gtgggcttcc ttcacaggt acattgga 708

<210> 280

<211> 753

<212> DNA

<213> Homo sapiens

<400> 280

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 tgaccggaca cactgaggat ttttaagcag ggagagaata gaattggaac tggtttcatc 120  
 tgcagggggc ctggctgggtg ttgaactagg agtcaggagc gggactttcc ctcggtctc 180  
 cctggcgtcc ctctctgag ctggcttcgg ggaccacccc agatcccgtg ctactcacc 240  
 atgggtcaga attgcccctg agggcttctt cctcgccat cgcgaggctg gggggagcta 300  
 tgtgggcctc tctgacaca ggccaacct atcatctcag cctataaata ggactcagga 360  
 ttagtctgga aatagctgtg ccaagccaac tccgcaggca tcataggcac acacagttcc 420  
 ggaaatggtt cttctcctca acacaattaa aaccaaacac ttctcagga aactattgtt 480  
 cacactccac tttgcttct taagcacaag gccgtcaatt ttggggggaa gaacctgcct 540  
 gcctactgct gattagtggg ggtatgctt gtggagagga ggcccttttc ctgcttctcc 600  
 ctctctgagg acctgaagga gtcactacca ttctctgggc ccagtttcc ccaaaggtaa 660  
 attagggagg tgggacatga tgccattttt aacttaccag gatttcaaaa attagaattg 720  
 taataaacat gtgagcaggg agaaatgaac agg 753

&lt;210&gt; 281

&lt;211&gt; 519

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 281

```

gggggagacta ggagtttaaat tctggacatg ttagcttcgg gatctaagt aatccatcaa      60
agtagaagtg tcaagaagtt ggccttaagg gagagacatc tgggcagagg atatacattt      120
aggagtaatt agcattttgga tggaaatttaa atgatgagac ctccatgggtc atgagactag      180
ctagagatga gaataagaca taggactgct caagggcact aatattatga gactgtgggg      240
aaaaaataaa gaaacagcaa aggagactga aaaggaataa agagtaatat agaaggtgaa      300
ctaagagagt aaggacacca attgaagaaa gtatatcaag gaggaaagaa tgatcaatcc      360
tgtcaagtga tgctagaaga tcaaataatt tacctgtgag tttagcagcc tagatatcac      420
tggtaacatt aataataata ttggacccaa tggatcattc cataagaaaa gaaattttac      480
tacttaaatt cttctaaaac aaatagtttt tgттаagca                               519

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&lt;210&gt; 282

&lt;211&gt; 666

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 282

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gggggtgctcc ttgggttttt gtcctctctc ctcttcccga gccttcctct gccctctggt      60
atgcctctgt cctccccaac cagcaccctg cccggccccc aacaaacctc cctgtcctgg      120
gccttatttc cttcttccag aacagttgga gatctgcacg gataagctgc tgaactcatt      180
atatgtagag tacatgcaag gatatttggt cggcgctctt ccaaaacagt aaaacatagg      240
aggggggaaat gatttggaat ctagctatcc aacaaatggg attgattaat tgcagtgcaa      300
caacaattaa aatatttaca aagaattggt agagacatgg catatccggg taagggaat      360
aagcagaatg cagtattaca tatagtatga gctatactat ctacaggaaa agaagcctgg      420
aggagaatgt accaaaatac taacagtgtc tgtcttgatg tggttaagatt atagctgact      480
ttcttttctg tgttacaatt tcgtgttttg ttttttaaaa attatacgct gatcatgtat      540
tacatttatc atcagggggaa agtgatttaa aaagatgaat tgggggggtg ttcatgtcag      600

```

atgggtggctt ttgcatcca tccaagtgtg taatgttggg attttcattt tagacaacat 660  
 ggactc 666

<210> 283

<211> 659

<212> DNA

<213> Homo sapiens

<400> 283

gggtagagaa agggttgata tgggggagaat tgggggtatg aaaaaatgca ctgggtcact 60  
 aaccccagcc catctcttat ccataaaggc atcaaaatat ttgcaacct aaggaattct 120  
 tgagaaaata attggaaact gttaagaacc tagagtttcc ctgtatcact gaccacagga 180  
 atccaaagaa ctttcaaata aagacatggg tctagaaaga acgaaaacta acctaattat 240  
 aatcccatct tccattagt atagccactg cccaaatagt cctgtgata gctaaagaag 300  
 accaataaaa agaaagggtt tttcctttgc tccagggtga tgggtaaggg tacttttgag 360  
 gaagggtgaga taaaaagtaa cttcaagttt tactcgctat agagatctta gaattttaat 420  
 gtgtgccaat tgtttcaaata tcaatacttt gaggaatcta ttcagtgttg actagacaaa 480  
 tctgatttgt ccatttccca tttcctttta ttaactctta gagcaaatta atactctaaa 540  
 ccacaaaatt aatttttcac tttctactcc aagtcctgta attattttgt aaaaaattcc 600  
 atttatttcc caagcataag gaaagggtatt ttctacttct aaaaattaat gcctactac 659

<210> 284

<211> 451

<212> DNA

<213> Homo sapiens

<400> 284

ggggcgtgaa ccatggtgga gcagggtgat ggtaacagt taagcttata taacgtaagc 60  
 ttaaattgac tttcttgtgg ccagacacaa aaccttagct atctaaacct cttgtcctgg 120  
 taaataaatg ccttgagtat tataacaggg caaagttcct tctaataatg taggtgctat 180  
 cagactcaga ctaaacatgt acactgcttg gaaaatatga accaaagaaa ctgtgggagg 240  
 ccgaggacgc gtccttgtc aggctgatgg gagggaagtg gggccctggg tggagcaggg 300  
 ggcactgcgc tgagtcttag gggactctgt ttcttcctg cagctttggg caagacacca 360

ggcccttagg aggcctcggg gtcctcatct gtcagactag gggctggccc agcagattcc 420  
 taagaaggct gtcggctctg atgtgtcata g 451

<210> 285

<211> 576

<212> DNA

<213> Homo sapiens

<400> 285

ggaaggctgg ggtcgggtgac cggccgggta tctctggctc ggtgggtgact tagggctctgg 60  
 gtctccgcag acgatttgtg tttgggcaag gcattcgtct accgacacac ccacagccta 120  
 cagtgagggga gtgtgggtga ggggatttct ctcccacttc cgactctccc tagagtctca 180  
 ggatgggggc tgaggaccga ggcgtgggag tgcgatttga caatggagtg atgaaggtaa 240  
 cccggaccgg gggagttgga gggcgctaag tcagccotga cggctaggga gtcgcctgct 300  
 gctgctgtga tcaaggaaat gtagtccgcg gaacagctga aatacagacg cgtcagattt 360  
 tgtatggagt tggtttgttg gtcatttaaa aagaaactga tgtttttact attgtccttc 420  
 gataatttat cagagtcagt gtcagtgcta tagtgggaat atctgttcag tgcagcagaa 480  
 atagatttgt tacaacagtt cttaaatagg ttatagtaga tagatcttta cagatgggta 540  
 tttctcaacc taagttttga ttattcaaaa aatacc 576

<210> 286

<211> 542

<212> DNA

<213> Homo sapiens

<400> 286

gggtaccttc cataagctag ttgaagccag aggaaatgag aaagatagga gctagtataa 60  
 aaggcactta agaattctgt ccccttgga agtcctgtgt gtgagaaatc aagcaaggat 120  
 aacttgtcct gtctgtcttt ttgtaaatca catagtctac ctgtaggcca ccagtgctg 180  
 tccattttgc atgtaatgcc agcagctggt ctctaactcc tcagcacagt ggttaaaata 240  
 tcttagacac actaagagtt tcaagttgac actcaaaatt ttaactgcaa atgctgaaga 300  
 gttagggact acacatgtca ttaatgcatg ctcaagggtc caaataaaaa cctggatctt 360



tgattgtatt taagttcatt ctgagatcaa actttttttt ttctttaagt acagatcaga	420
actcatattc ccagtatgga aatgtgagga acaagagtaa aatttcttaa ttaacgtcta	480
ggcttgaagc ttccctgat ctgtattaat gttcctttcc taatgaacta attcttaaca	540
ga	542

&lt;210&gt; 287

&lt;211&gt; 544

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

<400> 287	
ggcacttttt tgattgtac atttgctaata tatatgaatc aatctagaac tttcttctgg	60
aacaactata gcctcttttt gcttttgtgt tttgttttgc ctctacctaa cctatttttt	120
gaatcagttt acttttgtga attaatctca aattcttgca aactacttgt cacttttaac	180
aattattaaa atctttccct tcttatttta atacatagtt cataggaaag tatttcattg	240
ccagttatga agtctacatg attgttttag ccttttattt cttcagaaag taatataaat	300
cttacttttc tggaaggtag tattagatct atttatacat atggaggaaa atttgaggat	360
aattgagtca ttccatcacc actatccatg agacaaagac tttccatac caagtgtctt	420
taaagcatat ttgtagaatt aaataaaata tagctataca tattaataaat ctttttaaaa	480
aaacttctgg aaggaaggta ttatctaatt ggacatacta agttttcagt gctgcatttt	540
gagc	544

&lt;210&gt; 288

&lt;211&gt; 539

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

<400> 288	
gggaagctgt ggtaggaga atgtaatagt aatccagggtg agagatgcta gtgacttgaa	60
ttagggaaagt gagagagggg atgaggaggg agaaatgata ggacttggtg atttattgga	120
tatgatagat gaacaagtga gaaccaagga tgatgccag gtttctggct tgggcagctg	180
gatattgcca ttcacatagc caaaacagaa agaggagcaa gcttgagggtg gaagatgatg	240
attgagcttt gatatgttga ctttcaggta cctgttaaac atctgagaag aaatgtgcat	300

taggcagata tgtaaattta atgctcaaga gaggagtctg gctagagtta gactatgtac 360  
 ttaaagtact taaagtggta gctttcagtg gtgatgaaat tgcctagggg gagtgtatag 420  
 agcaagacaa gggccttgta taaagtgcga agaaagagat gtctacctag gaggccaaaa 480  
 attgagtcta gaaaggagaa aaccaaggt tgccatattg tataacagga accgtggag 539

<210> 289

<211> 421

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 289  
 ggggaagaaa acaaaaaaga gcagaactga gtcattgtga tgagactcta tgaccacctag 60  
 aggctaaagt gtttactatc tggcccttta cgaaaaagtg ttctgccttc tgagtttaggc 120  
 cagtgttcta tcattgtttt ccacgtctct aaccatcctt aaatgttcag ttccataaag 180  
 cagcctcttt aacaaatgca gcctaaatca gtaccactgc ctggatcttg tttcctagtg 240  
 taaaagaatc aaatnnnnnn nnnnnnnnnn nnnnacctca ggtcccttcc cctcgtcctt 300  
 taactttcct tctgggggaa atctgtaggt acacaaaaga ggggtggttca ctctttttct 360  
 agcaaagcag tgctattttag aaacatgaag atggaggggt aggaaaaggt tacattacaa 420  
 a 421

<210> 290

<211> 498

<212> DNA

<213> Homo sapiens

<400> 290  
 ggggctcaga ttcacacagt gctggtcata gtgccatggc acctcagtcc tgccaggacg 60  
 gcacactttc caccaacagc tgccctcaga gattcatgca gagataaagg gagtttgagg 120  
 caaggcctct aatctcctaa tgcttggtgc ctgctgctg acagtggccc tcgcttctcc 180  
 tggaggccag ggtatcaaga aggccttggt cctagtctaa ccagaagcca aatggatatg 240  
 taccttgaag ctataacctt gatctaccaa gaatctctgc cgcttggttg agtaagccat 300  
 ttcctgtgtg tcctgggata ccagtgagta gaaaaaggca ttgtactctt ctgcaaccat 360  
 ccctgcagga aaaaatgaga aacggcaata aagaagacaa cattagccat tagaatgcca 420  
 agagctaagg gtcccaggct caaaagcaag cactggagtg gaaaagccct gcactcgggg 480  
 ttaacacctg aacttggc 498

<210> 291

<211> 481

<212> DNA

<213> Homo sapiens

<400> 291  
 ggggaatgaaa ttgtccaaga gtatgtcagt aaacatgtaa gaaaatctaa aactaaacca 60  
 gtaacactca gggacaggca aatacactaa ggtcaaggat ggaaattaaa acaaaacaaa 120  
 aagccaaagc agagccagga aagtgtaaac acagaagtca agagaagctt taaaaaacag 180  
 tgttcaatag tgctggcaaa acatcatgaa agaaaaacta aaaagcaa attgatttgg 240  
 aagataagga cattattagt gatcttatta acaaaggtag aatcaaaagt cagactgtaa 300  
 tagatttaaa aggaggtaga gaagtcaagg agataacaga aatgatctct aaatttggtg 360  
 caaaaggaaa tagagaagat aggcaccaga gaggaaaata gtgtgggtgt atgagagtaa 420  
 agatacaagt tcttctattt gtttcattca tctatttaaa gtggctgaac caggaagtca 480  
 g 481

<210> 292

<211> 612

<212> DNA

<213> Homo sapiens

<400> 292  
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 aaactgtttg tcagaaaggg gtcaggacaa gaaatatgct gtagagacag ggtggtgtta 120  
 aaagggagag aatcatcac caggacatag gtccttgaag atcaggtcaa ctccagagta 180  
 gagatggggg tcccagaaag ctcaacaagg cactatcaga tacagagatc ttctcacagc 240  
 tgctctttct ttccactttt tccatcttct ctcactgctg ctgaaggga atacaccaga 300  
 atcttatggg ctttattaat gagtggctct gattacctca gcatttgatt tccaccaa 360  
 cctcatggta ttgcagtagg agcactgaag ggagaattga caatacccaa gtgctgtagc 420  
 tagctgtcaa agaaagggga cagtgccttg gttccaggag cagtggccg ggaagctctt 480  
 ccctatggat ggcagagaca ttctcatct cagaggttgg aacgtacag agttcagagg 540  
 ctctgcaatg agttgcacat ttgcgttcag tgcacattgt accattttta gttattttta 600  
 attcagacaa ag 612

<210> 293

<211> 510

<212> DNA

<213> Homo sapiens

<400> 293  
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 actcctccta cagaagcccc cagctctgcc tactttctgc ctctctttc tctatccatc 120  
 ccttacatgc tggaatgggc tgaaggctct tcctcagctt ccaactgtcc cccacctct 180  
 ggagtctca ctacaccca caacctaaact ctacactact catgtccaat ccagtccagc 240  
 tctggatttc ttccccaag tgtcccgagt acctctgacc ggactctgca aacctctca 300  
 cactgcacag gtccaaagct gaactcatct tctcctgaaa tgagctcctg cttctctgca 360  
 ttccctctct agtgactggg aacgttacct atccaccag ctgccaggc agtaaagcag 420  
 agtcagcttc aactcctccc tcgccgcaga tccaatcagc ttatttgaca caacctacca 480  
 gaatacacat ctttagaatc cttctatctt 510

<210> 294

<211> 422

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 294

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gggagagagt ctggtgctat ttgggggaaa gaattccagg caccaggaac agggaggagc      60
agggtgggca gagctgtaag gtggagagga gggttgggtt tgcaggctgc ctggggcctg      120
agcccagagt aaacagatgc tgaagaagag cctctgcaat ggctgtgcat gaggttgatt      180
cccaaagaac ccacctgca gggatccctt tcacggggag ctctcaagcc ttctgagctg      240
cgctctgaa ggtggggcct ctccgcctt cctgccgagc ttctcacagc ctggaaaggg      300
caggagggga ggctgtgact aagccccttc caaaggattt gctccccata gatgctccat      360
acaatacagg ttgtggaacc gaagttacta gagcaatgac tttttttttt ttttttgaga      420
ca                                                                    422

```

&lt;210&gt; 295

&lt;211&gt; 703

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 295

```

gggaggggtt ttaagcactg gggtgagctg gtgggagagt cctggaggac atcggatgga      60
ggccggttgg tgcagtcagg ccagcaatgt ttgcagatta gcgcttacca cagttaggcc      120
cctgcctccc gcagggactg ggagctgagg gtgttatctt ccttgttggg tacatttcaa      180
aggctcctgg gtccttcgag aagacaaagc tgggcagtga actgagcaag aggccaggaa      240
agggccgatg tcttaaaggg acggagaaat aattcatagt ggcaagtttt ctagagacaa      300
ggaagttggg gctgagagtc ctacaaaacc tggtcaaggt ttaatcccc ggacgggaat      360
ggtaaggctg tctgggcaa tggtcagttc atgcctccag tttagagcag cacctggtcc      420
ctatgggtcc tgtgagccac atggacaccg ggccaggcac aggagacagc aacagtgtgt      480
tccccaaagc ctctgcagac ccagccccgg gcgcacgggg tcacggataa caggaaatgc      540
actgccagcg gcctcactgc catgcgctgg cacaaatgca ccagggtgct gcctgccctt      600
catccacacg gtcagtggag cgcagcacgc tcagccgtga caccacagag ccacagggat      660
gtgtaagagg agtcggggag ggggagcctc acttcgtttt ttc                                                                    703

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&lt;210&gt; 296

&lt;211&gt; 494

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 296

gtatttgctt ttctttttaa ctccataaag gagtattoga tgttaacaga cgtaactctt	60
taatgctcct ctgttcatga ttaagtatgc taagttttaa gtaatttaga ctaatgtatt	120
aaagtgttca cttatgtcta gtcatatgca tacctactct cttctaacct tgagtcattt	180
ctattaaata cagcatttaa tcttctttca agtgagaacc atctttccat tatatcaagt	240
gggcaatatt taaattgtct gataagttca tccaaattaa tcccatcatg cctgtttaac	300
tcatttcccc aaaaagaccg cgacctccag ccagtcattc agttcttgaa ctccctaata	360
gaagcaccaa ggattatcta ttgtaatca cattgtggtg aattatcagt ctccaagaa	420
ttatgtaaag caaataggaa ttattttaga gttgccctta ttttaaaaaa caaaaaaaaa	480
gtaaagatgg gaaa	494

&lt;210&gt; 297

&lt;211&gt; 416

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 297

aaaaaaaaa ctttaaggga ttctgaattg ccagtttaat aggttaactt gaaatagctg	60
gagcgttatt attatacctt aatgaattgg tttttattat tatagtgtaa tgtccattaa	120
tagattaaca tcttgtagat tacctgtagt gttttgtcaa gtagattagg aactggtttt	180
ccttatctga ttgatctaata tatgaatgca ttgcaaata tttctgaata ttcttctcta	240
agggtgttca cgtaatagga agtgattgaa attaggtgct agataaaacc tatctgtcag	300
tagaacagcg gatgactggt aacctttcct gaacatgtgt ttcttcataa accaatggat	360
ctgttacaga aataatgtgt ctttaaaaaa ttacgtatct catggctttt ttgctg	416

&lt;210&gt; 298

&lt;211&gt; 476

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 298

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gggagaagac cagggtacac catcttcac accagcttcc tgggtgtcct ggtcttctcc      60
cgctgctttc gggacaccac catgatcatg attgggatgg tctcctttgg gtcaggagcc      120
ctcctcttgg cttttgtgaa agagacatac atgttctata ttgctcgagc cgtcatgctg      180
tttgctctca tccccgtcac aaccatccga tcagctatgt ccaaactcat aaagggctcc      240
tcttatggaa aggtgttcgt catactgcag ctgtccttgg ctctgaccgg cgtggtgaca      300
tccaccttgt acaacaagat ctaccagctc accatggaca tgtttgtggg ctectgcttt      360
gctctctcct cctttctctc ctctctggcc atcattccaa ttagcatcgt ggcctataaa      420
caagtcccat tgtcaccata tggagacatc atagagaaat gaagatgctt acctgc       476

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&lt;210&gt; 299

&lt;211&gt; 580

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; ()..()

&lt;223&gt; "n" is a single nucleotide whose identity could not unambiguously

&lt;400&gt; 299

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gggtctatct tctattatca gaatgattct ctgagagggt caaaaaaaaa gcaggggagt      60
ggggagggca agaaaaaaaa gctttttagc acagctgcaa tgaaacttag taagaaagc      120
aacagctctc ccttctctgt gttcagtta aaaatgaaat taaaaaaaaa ttgaggtcag      180
gtctacttca cagtgcctat aaatcccttt ggtagctttt ataaaaggct ctccttaggt      240
atttcttgcc aaaactccct tttctttccc aactggaag gaaacnnnnn nnnnnnnnnn      300
nnnnnnntat gctccacca agagcacgtc aatagtgaag ctaactctgc caaggaagct      360

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aagtgttttg cattttaaaa agtaacacat ttggtaagtg tggatttttt tcagctaaca 420  
 gaaataacca caacaaatga gaacggtaat aaaattgtca aaaataacgt gcatgtaata 480  
 accttcctag ggtacttacc caagataata tattgtttcc ttttaaatgg aaagccaaac 540  
 aaaacactta actggctgat gcatttctga gtcttctgct 580

<210> 300

<211> 493

<212> DNA

<213> Homo sapiens

<400> 300  
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 tagttgttac ccagcatcg tccatgccac tgattggatc gattgtcact tggccacccc 120  
 catctgttgt ccctgcctct gaactgtctg ttgtcttgca acctacaaca ataaaacaaa 180  
 aaagatcttt aaacttcctt tgtaaaaaaa aacatatgac aaacccatag cagtgtctct 240  
 ggtttctcat tctaatacac aataaataag actaaaaaac atttttcaca atagaatgtt 300  
 atagtgccag ttattcaaaa ctttcctaag attgaaatca ttcttccagt attatactag 360  
 gtacacttta cagagacata ggcagactat ataaccaata gaatagttcc aaattaaagt 420  
 gaaatctatt caattgtaca aaaatggtat ggtaatttat tcctttgact attttgaatt 480  
 attaagtaaa agt 493

<210> 301

<211> 566

<212> DNA

<213> Homo sapiens

<400> 301  
 ggttcatagg tgaagccac caatcttaca atattcaggt aacttcattg ctatctaaac 60  
 tgcttgaaag tgcaaaaaaa gaattgcaaa ttctgttttt aattcttgca tagacagtta 120  
 aaaggaaaag aaatcaaagc tacagatcaa tcttatttat gaataatggt gcaaaaacgc 180  
 taaataaaat attattttat gaaatccaaa cttatattat aataaacacc ctatgaagaa 240  
 gtaggggtggt ctacttttag aatacaaaga tgactcaata ttagaaaatt ctttaatttt 300  
 tatatgaaaa tagtaaaaga aatcacaagc ttgtctctat tgaagctgaa aacttaacat 360



ctgtttatTT aaattaagca tctattttcca atttaacaaa ataattacca aaataggaat 420  
 tagtagatag tagcaaaata caaatatttc tatgtatcaa ctcaaaatcc aatattatat 480  
 catgcttaaa aggcaaacat gaggaagttt tcctggtaag atcagccaca ggcaatggtg 540  
 ttactatca tcaccatag tgatgt 566

<210> 302

<211> 501

<212> DNA

<213> Homo sapiens

<400> 302  
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 aaattactct aagcttcttc ccacttaaga gttttgggtc ataaaatgtc ctatctgtat 120  
 aaataaatgt ataaataaat tctttcataa aagtaaacag cacttttaat acccttacct 180  
 gaaaaatttg ggcacacctt aaggcctcca ccacttgagt ttttaataac tgggttatat 240  
 ataagcctgg gaatctctga actaaccaca tcctgacaac cacagcctac tcttctctca 300  
 gaaatcaatt caaagagacc actcctgaca ctttaatgtg gagctgaccg cgtaactccc 360  
 ttgctccca ctatacccta ttggatttc catcctagca tagatgttat tacatactgg 420  
 actgtgaact ttttgagact agagaccaca tgtcacattg ccaacgtctt tctgtagtac 480  
 aagctactac agagtagacg g 501

<210> 303

<211> 505

<212> DNA

<213> Homo sapiens

<400> 303  
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 aatgttttaa tgaaataatc agagaacaag aaaatctatg aaatgaaaag cgatggccta 120  
 aactaaaagg tcaatagaag agttggaaga tgggtgaaga aatttcacat acctagaat 180  
 gtgtgggact ttaattatcc gaaaataaag aaaattaagg aacaattcaa gaggtttaac 240  
 taacatattc caaagagcag aacttacaaa tgttcaataa atgacataga ctttctcaat 300

a tgatgaaa ggagtcttta ggttgaaaga gaccacacct catatatcat atgatatagt 360  
 tttagaaacc cacactcaag aataccacta tataaat  c agaacaccag gaataaagag 420  
 tagattctaa agactcccaa agaggaaaag cagcttacac acaaaggact gggagtgaga 480  
 ccagcaatta acttcatcac tgtat 505

<210> 304

<211> 577

<212> DNA

<213> Homo sapiens

<400> 304  
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 tgctgctga gcccaggccg agaggcagct gccaggctgc gtgccacatg cccctgccag 120  
 gagggg  gt gcagttcatg tcttg  ttaa atgtgccagg tgctgagcag agaagctcca 180  
 gggagctgca gac  ttccat gggacccaac aagggcaggc atggagctgg acccagagcc 240  
 aagaagacca gacgacacaa atcatgc  tt caaagaagaa cccaggag  t caacccaaaa 300  
 tgctgatcaa c  tgatagt tt  ctgt  tc cac  tccagt t  tgggag  t gaaggagtga 360  
 gg  tgggcgg tcccagcg  c tcccgggc  t gggagaact   gt  t  t  t  t ccacacaggg 420  
 g  tgggatga aggcaggcag g  taacattg cagtaggaga t  taggag  t t  gtgtgtaa 480  
 gggcgatgtg acacggg   c c  tgtgcaga ggc  tggacc agag  cg  ca g  gt     c 540  
 g  g  tccag ggtaatggag catcagaacg att  cgc 577

<210> 305

<211> 447

<212> DNA

<213> Homo sapiens

<400> 305  
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 ctatt  t  t  t attag  t  tca ag    t  catt taaat  t  gat tt    t    t tt  cat  g  t 120  
 taagtacatg gacagaaaca acgaacatca ggaagagaag tagaaaaata cgg  tatgag 180  
 ttgcagaaac tacagatgag g  t  t  tagt at  tag    t at  t  gaaat tg  t  t  gaag 240  
 aagggagcgc c  tgact  t g  gcac  c  g   cat  t  t  caca g  ag  t    t tg  c  g  aag 300

tgtgtgctca cgtgggaagc agggttggat gtgaagagag tgctagtaat tacagtgcag 360  
 cagaatgtgc agagcaacac tgtaaccttc aaagttttta agccatttgt gcttaaatct 420  
 atattctcag tggtagaaat aaccatt 447

<210> 306

<211> 614

<212> DNA

<213> Homo sapiens

<400> 306  
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 tctgattgag agatgaagct attggaagga cctgaacaga ggagtgcacat ggtttgactt 120  
 atgtttcagt agggtaacct tggctgtgct gggaatagac tgtagaggag caaaaacaga 180  
 agcaggaaaa tgagtttga ggttactgca ctaatccaag tgggagagga tgggtggcgca 240  
 gaccagggtg gtggtggcag tagggtgata agggttttac atgtttcaa gatacaccca 300  
 ataggatttt caacagatga gatgtggcat gtgtaagaga gaagtcaagg ataatttcca 360  
 acaacagcct atctgaatac ttgtcctttg ccttttaaag atgatttata agacttcggt 420  
 tagatttgta ctatggttta cttgtaggac tcaaaaccca aaccactga cttgtgaga 480  
 cacttgagaa cagggactag gtttcattat tttcgaatca tccttctcac aagagcatga 540  
 cacaaagtaa catactcatg gtcggaattt aacaaatgtg cacaagatga atgaatgaag 600  
 gagtaaatga atga 614

<210> 307

<211> 684

<212> DNA

<213> Homo sapiens

<400> 307  
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 gcaaaagaca aaccttgatt ttagttctat gaacaatttg tttagtaagg cccagtcaa 120  
 cttgattatt tttcaacaac tgtgaattta tataatgata gccattttac atgatttgta 180  
 gttttaaatg tttaaatgtt aatcagatta gttagctctt tttgtgttta ttaggggtaa 240

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attacctttc tcttctgaag cgacaattat acatccatga ttgctttgac cagaatatac 300
gagggtatcc gcaatccagc atgtaattaa attacaatct gagttaccct ttcttgaatg 360
tgacattctt tccgtotcat tcctattaca atgtaatttt caccctgact taggtgttag 420
gaatgcttca gagactagtt attttttatt tcttatatga ttttttattc ttacccatat 480
tgtgtttttc cccaccccta gtacttacia ccttttattc tgtgggttctt gtgggattcc 540
cgttggtttc catctgtatt ctacccatgc tgccctggct gccttgagag gtcacttctg 600
cctttccagt gacaaaatgg tgtggtgagt agacttagat attgatcatc aaatacattt 660
tattttattt attttgagac aaag 684

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<210> 308

<211> 682

<212> DNA

<213> Homo sapiens

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<400> 308
gggtcaactt ggtcagacga gaggagctga tctcaattgg aggggtggtg ctggagggac 60
tctgggcaaa taccacaaac aggttgctcc tgacagcaaa gagcaagaac tgggggttctc 120
ttctactaag tgctgacttc aagaatctgg tagcctatct atcactctgt cttaaaccac 180
acaatccttt tatttaagca gttcaaactt cagttttgca gggtttatat agttaagagc 240
agctggctta catggcacct ctttgatctt tctacagaca tcagcagaat gccagtctaa 300
cataggatga ccttggtcca ccacagagca tctatcccat ttagccactg cccacttttg 360
gatgctaaca gaaaacatca ataaagaaac tattctcagc taaatatagc tacaaaacaa 420
gtgtcacagc tatacatatt acacttggtt tctaagttaa cgggaaatgg caatttcaga 480
aaagactgtc ctgcttcac ctcactcacc tctttgggag aactcagagc tgcaccacta 540
gccagtacca ctggtttggg aacagagatt ggactggtaa aagcagactc ccggctagag 600
gaaagggatc ctgacttgtg ctccatcctg ttagctttcc atgcattagg ctacacaggg 660
tgaaagaaca aatcagtcag aa 682

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<210> 309

<211> 624

<212> DNA

<213> Homo sapiens

<400> 309  
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 taggcttctt ccctttctac ttctggccga cgtaagacct agggatgctg ctgtgctcaa 120  
 ggccacctca ctccctcagt ggacacaggg ttagcttggc tgccctgctt ccatttcctt 180  
 accaccagcc ttcacatccg cccgggcctt tcagcttggc tcaactgcaga ttgcaaccgc 240  
 ttactcagcc tttcaccctg tagcaatcat aggtaacagg aaggaagcac atgctagtta 300  
 aaattgtaag aacttagctt ttctattctc atccatggta tgttcccact ttacttgagc 360  
 ttgtgacaaa agtcgcccac gtgttaatat gccatcttgc tggagaggca tctgaccttg 420  
 ccaggctttg ctccaacttg cttccagcaa agctccttag gacttctaata cttatttggt 480  
 aaaacaataa aacaaaacag aacataacct tgtatcccat ctatcccaga tggagaagtt 540  
 cttgaaaatt gtccggccca cttctgcatt tctactttca atatactttc cgagtatatt 600  
 gtctcatata ttttgaagga gaga 624

<210> 310

<211> 549

<212> DNA

<213> Homo sapiens

<400> 310  
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 gacaattaaa agtaaaaaata taaatagttc ttgtgttttg tttttaataa tgcaaagata 180  
 ccagtgttta aattcttgaa attattgttt tttttttctc tttagtctct taatccttgg 240  
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 tacttgtttt atatactgtg gatatgttgg atattttctt ttgatttctt ttttatattt 360  
 ttgaaatata catgattatt actatttctt gtttctctgt gaaacatttt attgcctaag 420  
 aaacagttca gtgaaataat gttttcagtg atgtctgtcc agccagtaag tagtacacag 480  
 tattttttgt ttgtttttca agagaactag tgaatacaaa actgttttaa tttactttac 540  
 gttaggtac 549

<210> 311

&lt;211&gt; 482

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 311

```

ggggaagacc taacattgtt ttgctttctt agaattctca gaagccaccg ctgaactgac      60
cgtctcattc acaaacaaag tcttcacaac tggtagtaaa ccaggcattt catgctcagc      120
agaaaggagt gtgaggacgg agctctctct tccattatct aagcctgtag gcttttaacc      180
acttcaccga actgtccgtc tcttaccaag aaagtccttg gtgtgaggct agagcatggg      240
tgcagagtgg agctctgggg ttcagaagga ggagcatttt gggatgatgg gccatttcaa      300
agatggcgga gccaaaggct tggcgggacg accgccatcc ctacgcactg ctcccaggat      360
gaagtcctag gctttggact cggtctgtgat ccaggatatt aatctcgctc ctcaactgtgt      420
ccaggtagag cccatgctcg gacgcacaca gactgtaggc acctggacat agcacatctt      480
ct                                                                                   482

```

&lt;210&gt; 312

&lt;211&gt; 478

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 312

```

gggatagcct atggaaagaa gggactacat gacattaaga atgctgagct tgctctgttc      60
gaactgagcc gagtaattac cttggaacca gatcgccag aggtatttga gcagcgagca      120
caagtgagtg tggctttctt tttccctctg tcattattgg attagttgaa tctcaatttt      180
tttctatta ctttattatt tgtaaatttt aatgctccct taaaactctt atgtttttct      240
atgtcggtac ttaatgcctt taagcatggt tgaaattaat agaaaactat ggactgagtg      300
atattcctga actaacatag aagagtaata tttagtatga aaatatgtgg ttgaaaatat      360
ttagtatgaa aatatgacgt gtactacttc tatagatatt cattgaaaaa tataacacat      420
aatatttgtg ttatatattt gaaaatataa cacagaaaaa tacaacacac aaaagaaa      478

```

&lt;210&gt; 313

&lt;211&gt; 572

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 313

```

ggggaaaagg atgggggtga gatttacttt ttaaaacttt aacttggtcc tatgtgaatg      60
ttttacttgt ttaataaaca atgaataaat aatagttgag tagaagagat ggaaaattac      120
acaaactttt gcttacttaa caagccactt acctaactag tattttttaa tgacatctaa      180
aagaaatggg attcaaatga ggtctccact atgtaaccaa attgtcatta ttactttaat      240
gagttttcta tttaaactct ttattttttt tatgttagtg gagagtttta ggaagctaata      300
aaaattgact tcttttatac aggtatgtca tagcacttaa tttaaagaga atatttttaa      360
gaaagaacaa aaccttggtta gtaagccctc tagaaataag tactttatgt gcctagagtg      420
ccatctcttt cgtgggtactt aggatcacag tgtgggtggg tgagtttgac ctaaataatca      480
ggcattcata caggggttctt tttcttgata catatatatg tgtatttttt ttctttccct      540
cgaatcttag aaatcattaa tactgatgag tt                                     572

```

&lt;210&gt; 314

&lt;211&gt; 672

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 314

```

gggataagga agggagcact gccaaagaaa caccttgga aggttccctg taggaggaag      60
tatctaagct ggaaactgct ttgtaaagta ttctgttaga aagtaaagcc attcctggct      120
ttacctttta acacccatca aacgtgttat ccagaaagat aacaaagtac accagaataa      180
gaagttacct aatggaaggc ttggaagaaac cagagtacac tgctcaaatac tgctcaaatac      240
tgctaatttt agacaaacag aaaatacttc agtgagcacg ctaccaaagg gtatttttag      300
agtctgtttc agttaaccac tctgaactcc tcagtaggtc aaacaaaaaa aaaagcaaaa      360
gaaagaaaac tattttcaaat ctatagcaag tagaaaatta tcttccttct tcatgcctaa      420
tttctttcat cctacataga aaataaacia tcagcattcc atagctaatt ccattctaca      480
cctaaccacc ttattttactt agtacttggg gaagaaagtt gactacagct gttacttctc      540
attgcttatac ttgagaaaac actgaacaat gtaaacaca tatgagcaat aggcaataaa      600
ttaagcaciaa aaaagcatgg ctccataaaa aagtgatcat ttaacataac tttttccttt      660

```

cattacttttc ta

672

&lt;210&gt; 315

&lt;211&gt; 678

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 315

gggggatggg agagacaaca gctccacact ctacagcggg tcacaactgc ttctccttag	60
ttgccacat ggctaaggca gaaagggttt aaacttagct aaaatacata ttttgattta	120
ctttagaaac ttgaactggc cccaggcaaa taataactac atgagaatat ttcatttagc	180
accttcctct ttcactccct ttagggaaaa gactgctgca ctcgaaaatg agggggaggg	240
aaacttaaag gaaaaatata ttogaacaac agccagagtg gggaaggtag gcacacattt	300
ctgagccaag ttccaagccc ctgttgctcc aatttgctt tgaacaatt ccactttgcc	360
ttctgttgct tgaacaataa ttattaaagg tatcaattaa aagtgcccaa ctccattgct	420
cccatggcca aagtccctgg cacatctccc gccattgcct gcagcacctg ccaccacct	480
gattttctgt gtcagtgggg tagagccagt ctaggataga gcctcttctt tggttgattt	540
aaggctggga gaaggccac taccatggc cctgccgcag tgaggaagga aaagcagagc	600
cttttctgcc atctctaagt agctagcatc agtagcctag tcacaacaaa tgcactgggc	660
tcagtattgg gaagacag	678

&lt;210&gt; 316

&lt;211&gt; 411

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; ()..()

&lt;223&gt; "n" is a single nucleotide whose identity could not unambiguously



<400> 316  
 gaaactgaac tcaaactgga gtgtgacacc aggttggtg ccttcctatc tctggggaag 60  
 tgaacaggga cttttcttgg gtacaagtga gagaactgag gcagaggcca gccctgatg 120  
 atgacagccc ctgngtgacc ttgattccc atctgaccct ccttctgttt ctgtcactcc 180  
 actggaagct actgtcccc atagtctttt tctgtgtcac atgactataa caacctccca 240  
 tgtgttgaaa gctaaggga gaaacacgt ctgttatgag ggaaagtgt tctcctggga 300  
 ctttgaagat ttttttcta caaggaagcc tgtctgcagc cttcacaagc actgcctag 360  
 gctggaaagt tctgttaact gatttacaac aagctgtgaa tattagtcag t 411

<210> 317

<211> 559

<212> DNA

<213> Homo sapiens

<400> 317  
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 caaaggcagt aattagagag tatctcctct ttgtctctga ttcaggactc agctaaggcc 120  
 cagcaaatgg gaaacttcct ttttaaaaaa agccagtgtg gtgctggcag tcattaaaga 180  
 tttgctgaat tactgacctc ttatgcccca catgccctgg ggaatctgtt agcagtccac 240  
 cacctcttgt cactaatcaa gatgccttta tgtaaacacc tcccttttaa aagcaagtca 300  
 gtcaggaaac ttaagtagat taacacttaa tcattaatta cctcatggga taaccaaca 360  
 aatttctttt ctgtttaggc tatctctgat cttctgcccc aggatatatt tttcaggcat 420  
 tgaaggactg atgtgagtta ctctggtagt cctggcactt aggtctcttg tgaatctgct 480  
 tggggaaagg aatgaaggca tggaaacagg acagaaaggt gaagctagag cagagaaaaa 540  
 gcactgaaaa gaaacttca 559

<210> 318

<211> 537

<212> DNA

<213> Homo sapiens

<400> 318

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gggCaacaga gcaagactct gtctctttaa aataaataaa taagtgtagg gacaaacagt      60
cactggaaaa acaacttagc tggatttctt ctttatttta catacaaaaa taaattctag    120
atgggaaaaat gacctacatt taaattttta aaccaataaa tattagtaat aaatgtaagt    180
cttcaggtta aaactgtgga ctgaccacac atattttatc tcccctccct ctgaaagcat    240
tgctaaaatg acagtaaagg aataagaata cacagctcta gaagcgaggt ttttagaaga    300
aaaaactgaa actgatgttt gtgtattcaa aacatattta aaggcataag tcagagataa    360
tggaactctt gacaaaaatt agcaataggt tcaatgaaaa ccaggtaaca aaaagcaaag    420
caaaccaaaa caaagtcaat tactaacaaa aggaaaaaaa tttacaagaa aaaagaagat    480
ggatcagtc cactactcc atcacagcac aaaagcagtc acagacaata tgtaaat      537

```

&lt;210&gt; 319

&lt;211&gt; 450

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 319

```

gggatttcat gtacctgtaa aaaagtatat ggctaattat tgttttaaag aatcatcata      60
caaaattact ttccttgaaa aacataagta tgatgacttt gtacaacagt aaaactacag    120
taccctttat aaaaacaatc ttatatcaac ttccaaataa accagacagc tgaataatta    180
aatagagatg acaacatatt ggtgcttacc ttctctaatt attaacctct attgtttacc    240
tatggagaac tgatattata attttaaata agctctcaaa ttctgattca aatggactga    300
ttaactgcaa catatcagtt tatttaaaca gttttaaatg tgagcaaagg aaaaacttaa    360
atattaataa attatacaac ttatagcact ctagtgtat acaaaaacta ttacttgttc    420
agagaaagaa agagaaaaaa aggaggagga      450

```

&lt;210&gt; 320

&lt;211&gt; 400

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 320

```

ggggcaccac taggacctgt cagctaaaag cagggcagag tggtgaggaa gaaagaggaa      60
tcggagatgc ctctttgatt tctccttac ttgtccgagt aaatgaaaat caaaacaagg    120

```

gaaggaaagc aggtttttaga aaagcttgag ctttgggata ctgagtttat ctgtgtaaca 180  
 accaagtggc tgttgtcagt atgtggttga agagatgtct gtgctagaga taatggggtt 240  
 aggagtgatc aatgtgtggg ccacaatgaa agccttcagg tgtctatcca ggggtactag 300  
 agagtgagaa gagggcctag aacagaactc tgaagaaaat tatgtttaaa tgaacagcaa 360  
 tacctggaac ttatcttaag ccattagctc tgttatctac 400

<210> 321

<211> 418

<212> DNA

<213> Homo sapiens

<400> 321  
 ggggaacatt aaagagtcaa agatgatgat gtccatgcta aggtgtctct gagagggtgg 60  
 tggtaogatg aacagaaata tgaaaactag ataagaagtg atgtgagagt agttctatct 120  
 tagtgatact aagtttgaag taaactgatt tttatatgtc taactagagt ttatgccatt 180  
 tgtagttaac aaaccaggc aggaattaat ccaggctact ctgagtgtga gctttaaatt 240  
 tgatttcctt tatttacatt gttaatctcc atgtattcac tgcagaact gtgcattttt 300  
 atattttagt atttttccct ttgagtttct ctgaaatgtt ttcttctaaa agtggttttg 360  
 catctttaac aaattctgct tcaactggctt ttttcttta aaccttgaat tttcttca 418

<210> 322

<211> 446

<212> DNA

<213> Homo sapiens

<400> 322  
 gggagtttgg aagctgaaaa gcacatggat gagtaacaac tgaatcagtg cccccagggc 60  
 acctggcctg agccacactg tgctgcgaag cccacaagg ctcaggaatg ttaaaattct 120  
 ggcaccttc agggctgccc aggatctgct ggcaggagat ggggttgag gagggggcgt 180  
 ctccaggaaa gtgaccagcc tggaggaaag atgcttgggc actgaaggga aagagcacct 240  
 cagagtgaac cacaggccac acgcctgcct gagcatagca ggcagtgcc cggcctccaa 300  
 tccgcagaag ccacagcggg gcggccccca cctgccattt gaaagacaaa ggccaaaacc 360

agccacagag gccaaaatcc aaagatgaag gttatgcaag acggagactt tttctatttg 420  
 cttttcttct gagacagggg ctcgaa 446

<210> 323

<211> 687

<212> DNA

<213> Homo sapiens

<400> 323

ggcgcggtac caggcgggca ggcgccacg ttcttcacag actgagcgtt tcagcaccag 60  
 gaacagcgac tccgccgttg tgcgccggg accagagttc tgagatcctg tccgctccaa 120  
 tccctgcctc ttaggactcc aggatgctgg cagggacgca agatttgggt ccggtctggtg 180  
 atccctgcgt atttcattca gctaccggac tccggaggct cagcaccggg ctgcgttctc 240  
 agggcattgc ggtcccagga gctcacggtt cctgatcccg agcgaacggg catctccgtc 300  
 accacgcagc tcagcgcagc gcagctctcc tcacacgttt gcagaggcga agtcctgcgg 360  
 cgctggcggc gcttctgttt ttgtccctgg acaattctct ccaggatgta tgagataaat 420  
 agagcttcta agtctgaggt cgacagtaga tgggtcttag gtgtcccaa agtcctgaa 480  
 atatgcaaaa ttctgtttac ctgcgttttc ctaggagaa ggtccagggc tttgatcaca 540  
 ttctcttcag cacacatgac cgcaagaagt taaggacaat gggctcagga gaggcagatg 600  
 gtggtttggt taggagcaca ggctccacga ttcaaattctc gattctgaga attattagtc 660  
 gggcaaaactc gggcaaatc atctttc 687

<210> 324

<211> 409

<212> DNA

<213> Homo sapiens

<400> 324

aattaaaaa aggccgctt gacctattca cctccactt cccgtctcag aatctaaacg 60  
 tggtcacctt cgagtagaga ggcccggcg ccacacgttg gcagtggcac ccgaaaatga 120  
 ctttcacgtt cgagtggcg aacaaacca tgagaatttg caacagggga ggaaaaaga 180  
 accaaaactt ccaaggccct gctatcttgc ttaaaaagca cttatgcat ggaacgcgtg 240  
 tttgtatctt ttatttacat tttatatttt tggacatatt gctaggggtga accattttta 300

atgatgtccg gataacaaaa ccaagccatg gagcggttctc tgtcctactt ctgactttac 360

ttgtggtgtg accatgttca ttataatctc aaaggagaaa aataacctt 409

<210> 325

<211> 725

<212> DNA

<213> Homo sapiens

<400> 325

gggataactt caaggggtgaa ttctcatttc ccaactgctca ttcagctgct ttggtgacac 60

aggtgtgcaa gaacaacagt caccgtctat cggtcatgac tatgtgaggc gagcagggaa 120

tgcctgaaca acgtccaaac actccaatct ctgttaccct cagatagtca aagaggaagt 180

gtcaccattt ccttgaagct tgggtgttgt cacagccttc aaggaagctg gggatgcctt 240

gaagatgggg aaaataccac ccagaattca aagtgataac tctttgaagg gtcaatggtg 300

ggaatgaaaa aatgcttcct agcatttttag aatgccttgt accatgggaa gaaccagtct 360

atgatccttg atgtgtactt ggtcaagtct gcacttacag aagcatttgg agaattttaa 420

agcatccttt tctttaaaga agaagacaga agaagttcag tggaataaca tggtagctga 480

atgcaataca ttttagacca aaaaatacca aaaaatattc atgtgtggta acagtaacag 540

tctcttcaag cgctcaaaat taccagacaa aactaactca tttgcaagct gaatggaaga 600

caaacattat cttctttaat acctagctac accccttcta gacaatttgc ctcttgcata 660

aacagagaca cagtcgtcaa aaacaggtta aaaactgggt aacaataaat gaccaagaa 720

ttaat 725

<210> 326

<211> 624

<212> DNA

<213> Homo sapiens

<400> 326

ggggggcagg ggagctctat ggtctagata gctggcagga agtcctctgt gacccgagaa 60

gggttagact atggggcttg agaagagtgg tgaccctgag gccagctgt gcagagagtc 120

ggagaagaga ggttgactgg cacatttaaa cagtgtggaa caatctgacg cctctggtca 180

ggacagaaaa atacaaattht ggggagaaaa gaaattaaga acccatctaa gccaaaggac 240  
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 gaagggaetg ggaaagagte ctggctggta agaaaagacc tgcaggctgt taggatcaga 360  
 gagactgcaa gtcctagaga gctgggggag ttaggacca ttacgtgcgt agagtcaagc 420  
 ccaggctgat tagccatggg aaattaattht gacagcctaa cccctggaa aaaaaaagg 480  
 catttaataa ataactcaat tcctcagtaa taacaagatt ccttataaac cagaatgtta 540  
 cgtcaggaaa aaatgtccac tgaaattaag tgatcttht tgaaatgtt agtactatgt 600  
 gtttagtgat tacaaaagaa aaaa 624

<210> 327

<211> 775

<212> DNA

<213> Homo sapiens

<400> 327  
 gggctgtgct tttcaaggte aaactgcaaa caaagcaagt ctgctctcat agccttggt 60  
 acagtattht aatacgcag ataataaatt tgttcatatg ttttcctga gtgaaattaa 120  
 tttcttgctg gtgatattgc aggttatata aatacataat actctctctt cacctcttcg 180  
 catattatca aacaatccac atttgacttc ataacattht gagacagtct acaatcatca 240  
 atcctggata ttacttcaca gctaaagtac ttacactaac aatattctga ttgtgatttht 300  
 atctthtattg tthttatcat atcaacaagg gaaattatgg gtttcatgaa accataatgc 360  
 aatgataaaa acataggaca agatggaagt tthtttattht tgotgaaaac atatttaata 420  
 gcagtctaaa cacaaaaatg taaactgctg tctthtgga aacataaac agggtcacaa 480  
 tthtgtaaga taaaagtht aggttattht aataaattgc cacatthttht cttatagaaa 540  
 aatgacccat atgcctthtgc tthttaaaaa aaaaaacaat actgggtatg acttatgtgc 600  
 tatagaagta ttagccatta ttactgtatt attatccctt ccaccagata gaaatttht 660  
 atthtgtact actgtthtgat gttataaaat tctattaata ttatthtggg aaggcactct 720  
 ttagtgaaga cacatcagaa aggcaaaata gttaaaaaa aaaaaaagct taccc 775

<210> 328

<211> 454

<212> DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 328

```

gggagctctg tgttgtagaga ggggtggtgt aagggtgggtg acaggaacag gaaggagcac      60
ccaccagata agttaatttt cttccccaag tttatggttt gaacatgttt gggcctggct      120
gttacgtccc aaataggaag taaaatgaga aggttgtctt atgagctgcc agttgagggc      180
tctggagagc caggagtgtt ggaggaaaga gcttggaact tctattcagt gaggctggat      240
ttccactctc actccacccc ttcctcttgg accctgggac caactcaatg atcctttctc      300
taggacttgg ttttctcacc tgtaaaatgg ctaagccccc ctgcaggggt tgggcacctg      360
ggcttgcttc tgttggaagc atccccccat ggctcccaa gtgtgagatt ttcagactag      420
ggcccaagtt ccaccctatg gtacggggaa ggta      454

```

&lt;210&gt; 329

&lt;211&gt; 422

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 329

```

ggaagagtct gtgttatggg catcacatgc aacttaagga aaaggaagaa aaacaaacac      60
tccacagctg agaaaaatgca tgactttttt gtgcggcggg acaaaaaata aaaataagtg      120
attttgaatt aactgtggct aactagcata tgaagaacac acacatgcta ttaatcgact      180
gataagaatt tttaacaaaa agttgtctgg gtgcgggtggc tcacgtcttt gtatattcac      240
ctgctggctt cctgctctct gaggtgcggg tcatgcactg ctaagtgact cttcagaggg      300
tgtcccaact tacacttccc cctaaaaagt gggacagtgc cttttttag aactctcaac      360
atctctttct tttatacttt ttggtttggt tttgaggctt tttttctttt acttttattt      420
tt      422

```

&lt;210&gt; 330

&lt;211&gt; 547

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 330

```

gggggtggag agatggggag aggggtccta gataaaccag gacaaggtgt ggtcacccaa      60
attagtagtg actggaatac aaattacata ctgaggaaaa tgaaaggggtg gaactgcttg      120
gtgatattta agttttacac ttatagttac tggtaaaaac cacatgaaaa ataatacaaat      180
gttttaaaac tcttgctctt catgcttttt ccccataaaa taatttttga taactcaagg      240
tttattagaa cataatatta catcatagca aaatatacaa tacttataaa agactagctg      300
cttcctggaa tgcattgaca gctgctggaa tatcccccat caccagatgt ttctgtccta      360
aacccaatag tttcttagct tcactatcca catccagact gcaaaaaaaaa gattttttct      420
agtgtcaagt actgtttaaa tcagtatttt ttgaatacct gctacatttg agcaatagtt      480
tcatttttta aaacttttgg actactctgg caaggcctgg ctaacgcact tattttaccat      540
cacaaaaa                                         547

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<210> 331

<211> 539

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 331

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gggctcgcc gcaactcaagc tcgcgctgct gaggcctcgc ccagtcagc ccacggagct      60
gctccaactg tgtctcctcc tccttgcccg ccgccgcacg ggaaccacc gaccaacagc      120
caagctccgt ccgcgcggnn nnnnnnnnnn nnnnnngccg actcgtggcg ccctttataa      180
tgccggagcc gggtgccaca tcgcaacaaa ctgcacactc attggctgct caagtccgtc      240
actcaaccta gcttcagcgt ccattggcc gccacggcg gcgcgctcta gacctggcg      300
ggctttgtcc tcattttaga acgcgcgcga gtccggccgc tacggagggc tccgaagcc      360
gggcgggacg gcgcggggtc cagggcgcg ggcagctaca gcacatcggg gggagggcct      420
aatcggattg taagctcgtc gaggcgctg gtctcttgct ctcgaggact ccatccagc      480

```



attgacagcc tccgcctccc catgtcccaa aaaaaaaaaa aaaaaaggcg cgccttaat 539

<210> 332

<211> 608

<212> DNA

<213> Homo sapiens

<400> 332

ggggaaataa ctattgatcc agaattgtat gctcaaataa aaccataatt caaaattagg 60  
 ttcagataca tataattttca gacaaaggct gacagtttac cttttgctaa agagctacca 120  
 aagaagcaaa ctgaattaat aagaagaaag aaagtgggat gcaactaaga aagaatgctg 180  
 agcagtggaa ttggttaaggc tgtgagcagt gtaaaggaac ttagctata taaagcaaca 240  
 acaataataa gcaacaacaa atacaaaacc aaggtagaaa aatatactat ttaaaaataa 300  
 catgaaggag gtaagatgcg ttaaaaagat ggggtaaatc tctctaaagt ctttgaacta 360  
 ttcaagaaaa gaagattaat tttagatgta agtatgctaa gtattcatgt taaaactcta 420  
 aggatgtcac tagaggaata gaaccagaat atatcacttt tataccagag agtgagaaat 480  
 aaagaaaact taacctatta aaatatagga agagaaagaa agaaacatag aaaaagcaag 540  
 gtaaataaaa ggtacgggat aaaatgattc agtaactaca aagaataaaa cctgccagct 600  
 tgagtga 608

<210> 333

<211> 674

<212> DNA

<213> Homo sapiens

<400> 333

gggctctgag aaccagtgtg ggcctctccg gtagaagctg ggatgttact gtgtgtgccg 60  
 gtagctggca cagtgtcaat ggcttgggcc tgacacagagc tccctgtgta gacccacag 120  
 gcctcacgtc tgggaccaga aagctctgtc cccaagccga ggcgagcagc agagcattcc 180  
 ctgctggccc agacccatgt gtggagggag gtgcagggga aagggaacct gggctcagg 240  
 cccattcat gctgccacg gggctggctc ccggagctgc ggaggccgc tggaagctgg 300  
 aggcaggtga atcccaggcc caccagagg accctctgag aggtctgtgg ggtgtcgggg 360

```

agggggcccta atcccaggcc catgcagagg accctctgag aggctgctgg agttcaggga    420
ggggggccctaa tcccagtccc gtccagagga ccctctgaga ggctgctggg gtgttgggca    480
ggggggccctaa tcccaggccc atgcagagga ccctctgaga ggctgctggg ctgttggggg    540
agggggcccta ggccaggcag gccagggtgat aacttggttt gtcaaagcct gacattggcc    600
agtcttgagt gtttaaaaaa atgtttttta tttctacagt ttgaatttta tgaatagctg    660
tcttcttacc tata                                                    674

```

<210> 334

<211> 811

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

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<400> 334
gggagggtgaa aaaatgaatc aaagctccat ctggagctta tcaatttggga gatgtctttg    60
tgacactgaa gtaaagatac caataggaag ccaagcgcac gaacctagag aggcctaggc    120
taaaaatcaa gatacgggag gaggtaacag gaggtacgtg gagagaaaac aattcctgtc    180
tcagtgttgt cttatttcat tacaagaaaa tatttttggga ttactggaca ctgttaagtg    240
cccatttggt ttttcttaac atgtctgata tcaaacctaa gacttttccc agcaaacactc    300
agctgttgag ctgtaggaag catgagaaag accaacggta catggttcat ccacaatgga    360
aatttttgtgt ttacaaaaga cttctgtaaa tacaaaatta tttttggaag acagaggaaa    420
aagagggtgat ttcatggaat tacatcaaaa aagaagagaa gtgagaagcc aggagggggc    480
tgaaagataa ctcatcttac ccaatgggga caaaggacac aatcacactg tgcccaattc    540
cattaccgct gagagcctgc cacagtggac tggggaagga ggggaagtgc agagaaaatg    600
gaaacactat gagctaggca acgtaggacc nnnnnnnnnn nnnnnnnnnn ngtcctatgga    660
tttaagccta tttatggaat aaaatcaatt taacagtagc tttccctgat ttcagagtct    720

```

cctgaaatac tgtttagttt gtgcacaatc tcaaattcca cagcatgtca ctggagttgg 780  
agaagatgct gggaaaataa tgagcttctc a 811

<210> 335

<211> 483

<212> DNA

<213> Homo sapiens

<400> 335  
ttatactgtg tctatcttct catgtaattc tcctagtaat tctaccatgg tcattttaca 60  
ggtagccaag gtaaaaaact agagaggttc aaggttacat ggctagtata taatagggat 120  
ctgaactcag gacaacccaa atacaaatta agccagtctt aattcaaact ccttggtca 180  
ttcaacttgc tatgcoctgc cgctgtctta gggagccaaa aagacctgtg tatgcgttta 240  
aacaacccaaa ttaatatatt acattagaaa accagaaagc aattaatctg ttacattatt 300  
ttcctttcat aaaccagaat ttatggccag tatgccttat tatttgagtt gtggttctta 360  
aaatggtcta accttttttc atcaaaaaac aaaactaatg attatttcag acaaggata 420  
atactgtcat ttggttact taaacagaaa ttgaggaata tgatttcata gaattagatg 480  
tta 483

<210> 336

<211> 441

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 336

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taatacccta tacttacaag atccccctg ggtgtttctg atgggcagct aggtttggga      60
tgggcaggtt gagaagagaa aggaacaacc tgcagtccag tctcaacgtg gcccatctgt      120
atttaccatc agtgccaacc ctctcacccc ttgtggggga agggaggggtg gccaccccag      180
ctgcaacagg tttctgggcc acctgggggt ggagccggcc aatgcaaaca gtcaagaggg      240
aagatggcca cctccacatg ggcaattcca aagcagggtt ctggctctgt gccacaagag      300
gccactgng ctccaaaacc aggaaaagcc tttcagaaag cagtttgatc aactcatga      360
taggatacat caaattaagg atgacaccaa gctaccaaag tctacctgtg gatggccaag      420
ttcagcagcc acgcagcata g                                          441

```

<210> 337

<211> 755

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 337

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cggggaaagt ctggtattcc aagatggtgg ctggtcattc tcaagaggag gactgcattg      60
cccaggcagg gctggtcctc tgcagggaca gctgaggttg actgagtga tgacagtcta      120
agaggaaact ctgaggaggc acctgagaca tcaaaactgt acccaagcta ttcaccttgc      180
agaaataaat tgccttttta atgtaagtgt aaaactatat cagttgagaa atataatcat      240
tatatttatt ccagcaagaa ttgattcag aaacaaatac aataggtgct catttcttga      300
aaagtgtaga atactttctc ctcaaaaaca acaaaaagc acgtaacatt ctagtgccca      360
caatcactaa caaaggttta ttttnnnnnn nnnnnnnnnn nnnnnnnnnn tgtaataatac      420
tgagaaattt cactgtagaa acaatttctg ttattattaa catcatttat attcatatac      480
ataaaaccca catcttataa tcaaagtatc ctcttttatg ttgacagggg ccatacttta      540
gacattaata agatcaggta tccattcagc cctctttcct aaatcatttt gcccaaatga      600

```

gaatatataa atgagtttta tctctctcca tgaacgattt tccagaatca aaaccagtta 660  
 tgtgataaaa cttaattcct ctaaacagat tttgtgtttc gagtttcaaa atgataagga 720  
 caatctgagt ctatattctg gaatagcaat taaaa 755

<210> 338

<211> 554

<212> DNA

<213> Homo sapiens

<400> 338

gtgcacgccc agcaccgtgt tcaoccacta ctttgcacac ccatggccgc tgtgcacacc 60  
 tatggctact acgcacaccc acagccactg tgcacacaca ccaacactgc acacttatga 120  
 ccaactgtgca catctgtgga caccaggcac actcatgagc ccatgtgatc cacagcagct 180  
 gtcacgcacg cagttgttgc acacgcccac gtagacacaa tgcccagtcc tcatttgtct 240  
 ccagtttcac acaaacacca gccgttaacc tctctctcgt caccacacg cctccaatac 300  
 aactgttcct gtcagctag gtggcgtgca ggcaacgtca ccattggagc tgcccatgga 360  
 cgtcttgctt ctgcacggcc atgctggagg tggcagacat gtcagcgtcc ctggggaagg 420  
 ccacctcacg ggcagctgca acagggagca tattggcctt gcaactgttaa tagcatattt 480  
 tgccattaaa gtatgtaatg atgaaattgc aatatatttt tcaataaaat ctctgatgta 540  
 ttcttatatc acaa 554

<210> 339

<211> 589

<212> DNA

<213> Homo sapiens

<400> 339

ggggtagaag tggccccacg caagtggctc aagggccaaag ttacaaagtt ttctgggttt 60  
 taagtactcc acgtgaagtt cctcccagtt accccttatc tggatgaagc atttggtttg 120  
 tggctaacta aaggctaagg tgaattggcg ccctctgtgg gtaaagggat ggtcgtctct 180  
 gcttggctca gggccaatct aagacactct ccttttcag ctgagacgtg gtggaagggg 240  
 gagggctgta gggagagtag cctttgatcc tttgctgctg gggcatgggg agatgggggt 300

tttccttttg ttttagcttt agacctttga ggcttgctgg ctgtcaggac tgcgatccac 360  
 aactttacat tctcaaactg aaagaacatg atgattattg tggtgccatg actgatctat 420  
 gtggtagctg tggaccttgg tgttgctcca tgattcagca tgaattggtc ttacgttcc 480  
 gcctccagac cctattctcc tgccttgctg ctagagactg catctctctt ttatctggta 540  
 actttatcta tcataata tgaactatcc tttcagccaa aatccagtc 589

<210> 340

<211> 478

<212> DNA

<213> Homo sapiens

<400> 340  
 gggagattct gcctcagtgg gcgtggaagg gaccaggagg ggttgatg tcgggtgtag 60  
 gtagtactg ccagcatctc ttgagactgc acatcacctc gggtcatgca tgcagctatt 120  
 ccgaggtcca agcatcttaa gattctaaaa aaaaaaaaaag gttacgaaag tcatggatac 180  
 tgagagatgt ccttgaaatc tgacaaaaca agtctcatga atatgtgagg ccacaccagc 240  
 aaccaactgg tattgctgtt tcccttctg ccccatgtgc tggcaggggc cgttgcaata 300  
 gccacgtcat gaaggcagag ctgcgcattt tccaggtgct ctccagctgt gggcatgcat 360  
 ttcccttctg tagcgttcac cctctacact gggttcggca agtgtacatg cgagggcagc 420  
 ctatcacgcg ttgcatctgt cttctgcaat actgaaacca tggcttcgtt ccttgcta 478

<210> 341

<211> 437

<212> DNA

<213> Homo sapiens

<400> 341  
 gggttgtgat totgtggtga gaatcaattt catagatgtc aataaactaa gaggaggatt 60  
 aatttagact ccgaggctga gcatgacagc tattttgggt caagtccaca tttcattcct 120  
 aaatggactc tagctgaccc atcctttccc ctgggtctggc tccctaccct tcattctgag 180  
 ttcagcatgc tgagtttggc tacatgccta tgaagaagca ctgggctaatt ttctagtctt 240  
 ggggccttct cctccccct gcccatcac cccactgttc attataaaag ccaaaaaaca 300  
 tggaagagaa tttggaaca catcatgcag aatcacgccc ctctcacagc aagaaatact 360

gtttggcctt cctcttctgc ctggatccat gcgtgtgatg gctgaaccgg gacactctct 420  
 ttatggtcta ttatttc 437

<210> 342

<211> 470

<212> DNA

<213> Homo sapiens

<400> 342

gggttttctc ctgggaacat caccaggag aaaacctgca gccctttatt agctatgtgc 60  
 ttgggaagag aaacctcctc aggtgagact gtttttctga acttcagaac cctgaacact 120  
 taacatccta tgccttagga gaaagctatg gtcagggtgct cactcagctg gaagtgtggc 180  
 caccataagt acatccatta ggactatgag cagtactggg agctgcacac cactggcctt 240  
 agagttcttc tctcacatac aaatgcctct ttgattatg aatgttaaaa tttttgtgcc 300  
 ttgtttaata attctgaata aagaggccta ctaaaatata taaaaacta gagaaatgct 360  
 ttgtagaccc tttttgtatt ttgacagtca caagtccatt gttgttgaac gtttattgag 420  
 ctctaacaat gtgacagggtg ccacacaaaa cattagacac agtacctgcc 470

<210> 343

<211> 426

<212> DNA

<213> Homo sapiens

<400> 343

ggggacccct ttcttctctg gttcatcctc agggcccgca ggagcagccc tggtcctctg 60  
 ctttgttctc ttctctcgca tgtagtcatt ttgatcaatc acatcctgtc tgtgagtaca 120  
 gcagacccat cagataggaa agacctgatt ttctctctca agtttatgtt acaggtcaga 180  
 tttgattacc acttccctct aagacccctt attttaggtg gcaggagaga agttgggtga 240  
 gaaataagag tggagtcata tttagtata cgtagtgcct cagatttccc aagcactcaa 300  
 gagtgagtgc ataaaaaccc aacaccagag ggttggtcat atatcatatc catataaaaa 360  
 catgtcaatt tgttgaattt ctctaata gtaattaaaa taatattgat actgtttctg 420  
 aagatt 426

&lt;210&gt; 344

&lt;211&gt; 555

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 344

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ggggaaaaaa ttgtatcatc ctatttccac tgagattctg ctgcatttaa aactctcggt      60
ataagttatg gctttatata aagcacaggg tcattttatc acagtaataa gaagtaagaa      120
gataataagg aataagaagg ggatatgaag aacctgctgg gagagaaatt cattcctaag      180
tatttcaatt ataattttca taaatgttct aggattctca ggtagccctg aaaacaataa      240
ggaatgcttt agattaacat gaacacttca agtacaaagg tcatgttgaa ttcattcatct      300
gccagagtgg cagacacata aatcaattag aaaatattat acatgttttg ttctctgagg      360
ttttcttata taaacctcca atttaattgt gaagcccaaa ctcattcatt tattaactcg      420
tgtattcgac tgagaaatat tccatgagca cccatctaca tccatgacac caaaagtctt      480
catgaaggtc atatcttcca tagtcatatc taaatgtgta aaactgcagt tgcaatggta      540
tgagaaaact ccaat                                         555

```

&lt;210&gt; 345

&lt;211&gt; 710

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 345

```

gggtaaattg tgatatatac aaccaacaga atatcagaat agtaaaagta aactatggcg      60
atgtgcaaca tcattttgaa tctcaggaac atgatgaatg taaagagcaa gtcagggtgaa      120
atttatataa agttcaaaaa catacaaaaag taaataatac aatgtttaga ataaaactac      180
tgaaaaacca agggaatgat atacacaaaa tttatgacaa tagttacttc tgatgggtgt      240
atgacagagg ataggacagt gagacactca cacataatgg aacatctacg tgattaaaac      300
atgtattgta acttttttagg gagggggagg gaagttcagt gatgtttctc ttctgtaaaa      360
gtagatgggg gatatgataa ctgggtctaca taactgattt attcacttta ttctttggag      420
aacaatgaat ccattttttg tgaattaagt tccaaaacaa aaatgaagtt gtattttctaa      480
gaaccctggg gttttgtggc ataaaaacaa ctatactaga tgggtctttat gacagttttg      540

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aggcctaata gtatgactct aagattaatt atctacaaac ctaaggaaaa aaacagtcct 600  
 tcatttcaaa aagttacatg atatgagata taatatcatc ccaagaacaa ataagttggt 660  
 aaaaaatttg aaatagtctc tgatctcccc ttctaaagc acttatgctg 710

<210> 346

<211> 670

<212> DNA

<213> Homo sapiens

<400> 346  
 ggggagagg ataaaatgtc aaccttaact tttcaaaagg atatattggc tataatataa 60  
 cttttcaaaa ggatatataa tggctatgaa atagccatta tattcagatc acaacaaaa 120  
 aagaactgta atgatactct aatctcttat tcaaattctg gccggggatg gtggctcaca 180  
 cctgtaatca aatccatgaa gtcacaaag ccttaagatt agtcgcagtc tttcacgtca 240  
 ctttccaaac tttttgttgc tttattataa tgtttgacag aactaaagtt tttccagcct 300  
 tgacaagata attgcttcca tatcacagta gaattgaaga aaaaaaaaaat acacagccct 360  
 gtatctcact gacaatgata aattgtcatc agataatatc atctcacaag tacacagtac 420  
 cagtagttgc ataattttta gcatgaattt tctaaatagg acttcaacca atttttttta 480  
 tttggctgta tccttggttag gggacagttc ctctttacga aaagtcctga aggcataggg 540  
 tgcttttaaa ataagttaca ggtataaatt gtgaatccaa acccacagtg gatgccacaa 600  
 aactcatgtg ggtttcaata atagattggg ataaggcatg tccttaaaaa gaatccatga 660  
 ttcagtttag 670

<210> 347

<211> 671

<212> DNA

<213> Homo sapiens

<400> 347  
 gggagtttaa aaaaaaaaaag cattttccca cttaaagtgg aacaatttga agagtcctga 60  
 gtatatcctt aatgtgacta tgtggaaacg ttggtgtgat ttaggtgtga gtactcatgg 120  
 ttattcatta ggcagtttta actgattttt attttttagtc cgtaatttag tttttacctg 180

```

taatttcatt ggtttgaaat tggaagcatt aggaaacttg aaaaatatat aaaaataata 240
gcatttgtcc ataggtaatc tttaccctac atataaattg tgtttatctg aaaagaaaat 300
tctccttaac acatcaagat gtcttttata gttcaatatt gtgcttaaaa tgacaaacca 360
cagtgatgat tttatcaaac ttgtttttca tttataggga ataaagacca tccatacctg 420
aagtgtggta ttgacagata attgcttatg agttgccttg agtgcatttt attatctcat 480
aaataaacgt gcttgtttta gaaacaagga cgtcaagttt taaaaataaa tgtttaaaaa 540
agtgggtcat ataagaattt cagacattaa atcataaaat gttttttgtc tatttttggt 600
gttgcagcat gtggttaaat gtcagtccac agttcaacat gtatttgggt ctcaaagcaa 660
acagtgtgcc g 671

```

&lt;210&gt; 348

&lt;211&gt; 574

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

```

<400> 348
ggggtggatc ggttaggaagg cctgggcttt ctttgtttag ttggtgtggg ctggggctgg 60
gctcagtga tgcgcccaag tgtgcaccgc gcggtcagct gcccggcgag gtaacagctg 120
gcacctgtgc gcgaagtga gcctgcatta gcagcatcat tattcagcat tagagcatta 180
caaagataat tactgcgagt tagaaaagca gaggacagag ggaattgaaa cccagaccc 240
cttggcttat caaactccca ggttacgagt gtaatttcaa gcagctttgg gaaagccacc 300
tctcgcaaag ctgtgagtct gccacgttaa aggggacgct cagaagaccc cacagctgga 360
gccagtggcc caagggtctt ttccaggtt tcatcctggc tcaaagatca aattagtgtc 420
atagatagga tgctgaaggt catcacacta acattttctg gtctccaaag cagttctact 480
tagactatca gaaccagcct ttttaaactc agaattaaat gggtaaagt gagcagagca 540
ggtactttgg tctttgagta acaatgatag cctc 574

```

&lt;210&gt; 349

&lt;211&gt; 433

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

<400> 349  
 agtgaccaat gaaatatcag tgcaatagaa aagcaggtat aaataacacc aactggtaat 60  
 ttaaaatatt tggttttaaaa aacaagatga agcaggagag gcaaaatgtt aactgaaaac 120  
 taagtgcacag ctacatgggt gttcattata tatcttactt taaaaagtta tgtccaagta 180  
 gtggtaatac tgaccaatgg tactttcaac ttggcatttt tgaggtgtta ctagataagc 240  
 ggaaaaagta gcttaaaaat ccactgcaac cacgaatata taaatcaaaa tccagactaa 300  
 caagggcgat gcaatccctc tcctcttga gacagtttat tttttaaaat ttactttgtt 360  
 cttggttatt tcaaaacaca ttttaacctg gtattttgcc agagaatctg gctatcagtt 420  
 attttatgtc cag 433

<210> 350

<211> 523

<212> DNA

<213> Homo sapiens

<400> 350  
 aagaagaagc acaatccctc ttccccaat agaagaaaac agccaagcta gcacctgcac 60  
 gtgtgggcct aaatcttcct tttctcttc taaaaagctg ttcacacagt atcagcctcc 120  
 ccacatttca aatgtagaat cagttacagc atgaagaaaa caaaaaataa gagctgcttc 180  
 agccagagac tctagaaaca agatcatttc catagcatct cctgttataa atgcagactt 240  
 cagtcactgc ccagagact gaactggcag ggtaggtagg ggacatgacc caaaaatatg 300  
 catatttttt aggaagaagg agctgattta cctgctcatt caagttaaag aaccacagat 360  
 caacagaaag gaccaattcc ccattttgtc ataaatgcta acctacacag tagtttcctt 420  
 aaagaaaatc acttacagag cagagttgta cactactggg ggcaaaaagc cctgacagac 480  
 aactgactct gctaattcctt gtgtgaaaaa aaggggagat tcg 523

<210> 351

<211> 434

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 351  
 cctcattcctt ttccccacat tagttccttt gcttttaaga aaactgctaa aatacagagg 60  
 aaattgactc cctcattcaa ttaaaaacac agttattgtc tactgggcca ctatgtacag 120  
 atgtataggt tggtccctgc tgaagagaga ttggtgactg gattccagcc cataaannnn 180  
 nnnnnnnnnn nnnnttctgt ttctaatttg caciaagggtg ctacatgtgt gtttcagaag 240  
 tgacaaaact gggctttgcc cacatgtagc atgtagcttg tatctcatgt ctgaggggaa 300  
 aacagacaag taatcaagaa ctacaatata tatttaaaaa aaagaagtaa aaaaacccta 360  
 caatacatat aattaatgct agtctaaaga aggcaactgca agaacaaaaa aaaaaaaaaa 420  
 aaggcgcgcc ttaa 434

<210> 352

<211> 440

<212> DNA

<213> Homo sapiens

<400> 352  
 taccaaagag acttgtgatt tcagtatggt tggaaataag gggcatgaaa ctgcatctgc 60  
 agagccttca cataaaactg agaaaacgtc agttggacac atcagagaat ggggggttgg 120  
 gtgggctgac agacacttgg ggatgcctaa atccctgtcg cctaccctc taaataccac 180  
 gctggccatg tcatttctta ctgacacata aaacagtctc taaaacaaga caatgtcatc 240  
 actttaatta agttcatta ttgatgttta aaagaaaaat actcttggct ggcaaataat 300  
 gaaccttagt tgtgatttca gactttctat ctatattgag aaatactgga aaacaagaag 360  
 aatcctcatc ttcaaaataa gaaagaagaa tggattccgg aaaggagaaa gatagagggt 420  
 gcctgacatc ttctccttg 440

<210> 353

&lt;211&gt; 523

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; ()..()

&lt;223&gt; "n" is a single nucleotide whose identity could not unambiguously

&lt;400&gt; 353

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cggtggcggc cgcgggtagc agggatagaa gtggggagca gatgagatgg atgctcatga      60
gtcacaggta ccctattaag aggcaggact gctttttctt caaggaggcc catoctagga      120
ccctgccagt cagtgccata atttttctaa tagctggcag ggctggcagt gagacatttg      180
caagctttcc ctctgtgcct tcttatgacc gagggcacc atttgcctga atacagagaa      240
ttcatgggca ctctgtgaag gaagggctgg ccagatgcca ccaacagcac caaccaaaga      300
gagaaacaga gggatccaat cacactctcc aagccactgg cctgngaagg ggaaaggaca      360
gacaaaggtc atagctgggc ttggtcacag gaactgacct ggagctgctg actaagggca      420
tcttgaagga tgtaattacc ttctccctt ggggccccag aacaaggaag ccctacagct      480
gaaaaacagt aattaccagg cagatcgaga agacagcctg gga                          523

```

&lt;210&gt; 354

&lt;211&gt; 557

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 354

```

cggtggcggc cgcgggagaa aaaatgtact cacgatcgta tctggggaag gtctgtttct      60
at ttgtgac ctgtatttct aaaaatttga atagcagctt ctgctacctt gtcactctcc      120
attcttaggc actgtaacaa ggactcatat gtctctgcag agtggaacga ggtaggatgt      180
gtaaaagaca gaacctgaaa aaacagatac agcttttagaa gtacagacaa tggttttaat      240

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ccattaaaaa agaattactt cccgcaaaag aaaaaaaaaa tttaattctg gggtaaatat 300  
 gctagctaca cagaatagag atacatctcc tagccgtcct tgcagttagt tatggctaata 360  
 cagacattat cagaaatact gtatggtgtg gtagcttcca gttattcctt gacacaacta 420  
 acagacagcc tttgtcctat tttcttcttc acctcttagt ctactctgct acttagaaca 480  
 caaaacacat ggctcctttt ttatggaatg tgatttaciaa tattaataac tattatcagt 540  
 ttataaatat attgtat 557

<210> 355

<211> 562

<212> DNA

<213> Homo sapiens

<400> 355  
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 tttgtctagt ctaaccctca ttatacagag aggggaactg aagccaggga acgtgttcat 120  
 gacttgccca gtcccgaatg gaaatcccca attaaatgac ttcaatgaac tacaacggaa 180  
 ccaagtcaga gcctatagtt catggccact cccacagga caggtaacca aaggcagaaa 240  
 gagggggagg caaggagggt gctgtggccc tgcaatggcc tgactctacc tctgtcctc 300  
 acctatttcc caactcccc tggtggatcc tgccctaata caaaatttgg acatgttggt 360  
 ccttgaagat tttgggggca ttccgtttga attttcaaaa tattgatcat gataactatg 420  
 ttttgtgatt ttcttaaaat ccatgccag ggactccctt gccttactcc agtgcaagtc 480  
 caggacaaaa accagccact ggcccactgc tgaaggggtg ggaagggtgac tgagagacga 540  
 gagatcagtc ctgcttgctg at 562

<210> 356

<211> 460

<212> DNA

<213> Homo sapiens

<400> 356  
 gcggtggcgg ccgcggggga atagtttcta tacttggaga tcataccaga agtagacagg 60  
 ggtgggagct tcaagacaca attcgagtc aatcaacaga taacagggtt ggctgagatt 120  
 ggtggtggta aaaataaagg aaagtgaag gattcaagaa ctattcaaaa attttaaatg 180

agttaatgat gcctagactg aggactgatt taactggaag aaagtgttaa ggagtattta	240
ccaggtttct ggcttcacca attggatgaa agatgacatt taatgagaca aaatcataaa	300
actaccaagg tgagggtgga ggggagtaaa gctcatgagt ttctgttttt aattaaagt	360
aatctgaagt gcctttcaga catccaagtt gatacaacgt ccaagggcta agaatgcaag	420
ctctaagggtg tgattgctgg ggatgaaatc ccagtctgcc	460

&lt;210&gt; 357

&lt;211&gt; 594

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 357

cggtaggcgc cgcgaggga aatTTTTctt taaatcttaa gagcctttaa taaacgggat	60
attttaatat tttaatgtta ctacatttaa aaaatagtgt ttctctacaa aatTTTctgt	120
attcagtata cgTTaactat gaaaatgtca aacaatgaaa tcattgaaat atatttaagg	180
aaaaattacc aacaaaaagt aatgagtacc ctctatgtgc atatttactg gaatgttcat	240
gtgaaatggt aacatttcca ataacagcat tttgaatctg gggtagacaca aacatgattt	300
ttatttttga gctagggatt ttgatggaga agcacctaga tgaagacacc atttcattca	360
tgatatttta aaattagaaa agtaaagctt ctaaattgaa actcttaaca ggTcacttca	420
tgaaatTTTT agttttaaat ttaattttac atgagatgtc tttctgaaga gctactttta	480
ttaactttca cttagatcgt tgtatgctag gcattcagta tttctctact tgattttcct	540
atgcctagtt gtgattacag caagtattta ataataaagt cagtcatgtg agag	594

&lt;210&gt; 358

&lt;211&gt; 698

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 358

gggggtgggc gcagggtggt tatgaccggg tggTccacaa ggtggtcagg acctcagctg	60
gtggctgggc ttgggagggg ctggcatgga gTcacgggcc accatcccct aagtgtttcc	120
ataggcaagg ttctcattcc cctagtcagg ggagggggacg ggtacagaga agcgacgcaa	180

tgagccagga acagagctga gatgaaacct cagcctcccg tcttcagaat gagaattaat 240  
 ccacagagga gctaaggaaa atgccgggca ccgagttgac ggggtgagggg tgtgagccat 300  
 gtggccggca tggccgcccc accaccagct ccatcctgag cacttcacag acatggccct 360  
 cttcatccac acaactgccc caggagccac tgaatgaggc tcgatgaaac ctcaactcgc 420  
 gttgcagcgc acgtctgatc aactcgcct ttgatcactt ttatcactgg ggatcctgca 480  
 gtcagggctt tgtgtctgca gcggctccctg ggaaacaatc tacaactcga agctccacca 540  
 aactcactca gagtcacaaa atttctatca ctgactgctt tcctccaagg cccaaactgg 600  
 atttataaac ttccaaagaa aacttcatat tgaaaaagcg atgtaccac agcattgtag 660  
 aacgatgttc acaaaggaaa aacaaggccg ggcgtggt 698

<210> 359

<211> 667

<212> DNA

<213> Homo sapiens

<400> 359  
 gggatgcttc taaaaagtaa atgtgctgac tcctcacctg ctcacacggc taccgagga 60  
 tgattttcac atcccttact tgagacgaag ggatgttgcc actctggetc ctgcccatgc 120  
 ctcccttttt cttccaccat cccacccct ctgctgtccc tgcttcagcc atagttagct 180  
 gctctccgag gcttctgtgt ccacttttg ttctctctc caggctgttg tacttgctat 240  
 gtcttctgcc ggagttaccc ccagccttcc tgcattctcc caaacttgtg tcccagcaa 300  
 gttccttctg agccctcaga tctcagctca ggtgctgcct cctctggaag tccttctcag 360  
 atttctcatg acaccatgag cctctgtgtt agcccccttt cactctggat tgtgtgctag 420  
 actggcacat acatcccccc caccagccag ggagcaacac gaggtgctc ttggtatacc 480  
 cagcacgggg acgggtgtgg ccagaggcca gggaatgctt aatgaatgaa tggggacagg 540  
 cagcttttca gcagcgaggc taagggtggg atctgagtag cagggccgct tgctcatgct 600  
 acctaagtgc agggcagagt gtctcccagg agggaggggc tcctcgtatc ttctcttggt 660  
 ccctgtt 667

<210> 360

<211> 415

<212> DNA



<213> Homo sapiens

<400> 360

gtctgaaaca tggacctgt cccttgatga gttgacacaa aagatattta caaatatcta	60
acagaaggaa acaaatgact tgtgggtaat gagctaccac atagagagat ggcttggaat	120
agtagagaac ctttcatgga gaaattggga ctccattgaa ggatggatgg ataaaaatta	180
catgagtaat gttttagggg agtagttata taatatttgt ttttttcctt catgattctt	240
tcttttttcc cctttcttct ccaggctacc atacctctac taggtatggg gaagacctta	300
aaagcaagga taagcagcat gaatagagct agaatagtaa aaactagaac atttttaggat	360
aactaaaatg ttggaaaaag aaagcatggg ttgaggaatc attccaccta ctgtt	415

<210> 361

<211> 643

<212> DNA

<213> Homo sapiens

<400> 361

gggatccatt gttgagaaat gctttcacta ctgggtcaaa caaaaaactt ttcattatgt	60
agcggttgta aaactcatct tttaatccaa taatctttct tttaaaacga agggcacctg	120
aaacacagag gcatggttgt ttaaatcaca taccactctt cdatacttta gacttaccaa	180
acaaaaataa coatcaaacc aaaaaaaact gtttaacaca tatcaataat tatttatgat	240
gtttgcactt cgggaactgt gaacctaaag ataaggatta tgaaaatgtt atcagaaaaa	300
tgtcttctaa aagtagtata tgtcatcata gaacacaagt cttagaaagc cagaaaaatc	360
ctgaaaataa accagttact aatgaccaa atgtaattta catctaaat aagagctaag	420
acaaatgaat gaacctatca cactacttaa gatgaaaaaa ttcaacatga ccttttatat	480
ccaccttaat agaaaaaacc agtgttttat tagggcaatc cactgtataa tttgatcttc	540
aatatttttg gacactctta ttattttgca ttgtagttca tggaatttta tttatttggtg	600
gatgtggctg tagaaaggcc atcaaccac aaaaatctgc atg	643

<210> 362

<211> 712

<212> DNA

<213> Homo sapiens

<400> 362

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gggggagata gatgaaattc gcaagtcata ccaggaggaa ttggacaaac ttcgacagct      60
cttgaaaaag actcgagtgt ccacagacca agcagctgca gagcaggtaa tgggaaactg     120
aagcactttg aaaatagagg gaagggtgtga aggactcaga gagaaaagct tctgggtttct    180
tccttaccct ttaggatgac atttctcata gctgatactc tcactttgga gaaaggtaga     240
aaaagtaatc cagatatgtg caggagagcc aggaatcaaa tggagaatct tctttctttt     300
tttaaagctt agttaatatt taattacata agtaaaaatg aaaaatagtt tccttacaaa     360
aaaaattcca aacatggtaa ggccaaaacc atcaaccatt ggacaccatc cttcaggcac     420
attatcatcc ttgaaaagaa gggattgatt taggtcatca ggaagggaac cagggatagt     480
ggcaggacac agctggatct ctagtctgtg caacagcaac ctttctcatt ataagcttaa     540
aatTTatatg catacatttg tttaattaga gtgcattggg gccctcaatt tgaccacctc     600
tggggaatttt ggtgaaaaaa agtttctgaa cctataaagt ttagggttca gacctgaaa     660
agcagtgatc acatggccct gccctccagg gacctatcta gataggcaca ct              712
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<210> 363

<211> 699

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 363

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gggaggtggg ggaggaggag gaatagatta tcttctagta ttttccaaat gttctatatt      60
aaacatatat taacctttaa aacatctact tttgtttgat tctcaaaata atataaaaca     120
ctactatata atttaaaaag aacattctaa tcttaataat ttcataaaag gaggtcacag     180
```

```

ttcaagttgt aggcaactat aaaaatttcg ctcttgaaca accaatgaac atatacatga 240
tttgaaggaa aaatccctnn nnnnnnnnnn nnnnctaatt aaagagaacc ttgaaattaa 300
gtaaatcaat tcttgacaga aagacgaaga tgttttctgt aatacaagaa agcaagatca 360
cctttgcccc agacatctaa tgtagtagt taaacgttcg aattctggaa taaaaaactc 420
agcaaagtct aaagtatgac tctgggtgcc aagaaaatgc cacaggaact agcatttcca 480
atcagcagct cctgagatca ggaagactgt tatgttctat gatataaagt ccacaataaa 540
atctgttagt ttttctggtt aaatgctcat gctaaaaata gtgactgctc aaatattaag 600
taagaagact tagttttgcc ttcttgttca gtctctgaa ttccaggcaa ttgggttttcg 660
atatcttgtg acaccaatac ttgacatcta acagcattt 699

```

&lt;210&gt; 364

&lt;211&gt; 661

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 364

```

ctaaagacct cacaactatt ctaactaagc tgaaagcgaa gacagataat gtagttcaag 60
ctaaaactga ccaaaaggta agaagtagaa ttttaaaggg tactactgaa tgaattaaat 120
agtttttggg gtcagtttta cttggggata taggataaaa accttttagg aacctttttt 180
aaaaccaaat agtaacagca ggtggtaaag aaattttgta actgaagcaa cacagatcct 240
cttacataat tgatcattat aattgaacag tattaataaa tatacatgca tgagtgtgta 300
cgaaagaaga gcgtcaaagg actaagtgat gatttaggaa tacaagtata taaattccaa 360
actgaattgt gtccttggtg gctaaatctg tgttcttcct ctgttgatga gttcaggagac 420
tctaatecct tttgggtggg gcagaaggaa aatgttagcc ttctcactca gcctcatagg 480
aaataaacac cagcattaca acatatcctg ccctgccttt ccaaccgaag aaacaaaaat 540
gacctgatca tagtagaatt atagtagaat tattcattat aatatttggc tttgacaaaa 600
atcagtctga tctcgggaaa cctggagaaa tttattttct gtactctaata gttctttcat 660
t 661

```

&lt;210&gt; 365

&lt;211&gt; 546

&lt;212&gt; DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 365

gggggagaag gcaggcgaga gagagagagg aatatgcaca aaacctggct caagagtaat	60
ggtgaacagg aggggttgga caaagaccag cgaaactgga atggagagaa attaatggga	120
gtgaggccaa atcgtggggc ttacaggtta gcgtgtccat ttgattgata accatttgag	180
tgaccattct ggttgataaa atttgagaat ttatcaacc aaacctgat tcttgagagt	240
aaaagagggg gctgttaatt attaaacaca gactataagc atcagccagg acatatgggc	300
acctcgcttt tataggcctt gttaacagta ttatctcttt ttaaagnnnn nnnnnnnnnn	360
ngtgtgttta cttcctaata aaggtgtcag ggagttgggc caaaaaggac ccaaatggaa	420
ctcaaaggct gggtttttcc aaacggctag attgatTTTT tttttccga tacagatatt	480
agtgaccctt taacgtttta aaagtttggc ataaaaagat ggattttatt gtgagctact	540
agatta	546

<210> 366

<211> 503

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 366  
gggggaacag tctttggaga ttagcggctt agattaggta cttaaaaaaa cactattata 60  
gggtatcatc aaattacatt tgttggccaa tcttatttct ctgagtgatt cagtctagga 120  
aagaaataac accctaaaga tggtcagata tgatgctaaa ggaattaaaa agggttgatt 180  
ttttttttct ttgctcagga ataaactgga attctagaag gtcaaacttc acccaaactt 240  
aaaaagatta annnnnnnnn nnnnnnnnn nnnnnnnnn nnnnnngct aaaaaagtca 300  
ttagatcaat ctgacgaaga acttacgctg gctacatgtt tagatacatg agtcgacttc 360  
cactaacgtc cgaagtggag ttttaagagat agacttgag gctgctatcc ttaacatgct 420  
gccctgaga gtaggaatga ccagggttca agtctgcttt ccacagaatc aggcatgctg 480  
ttaataaata ctggtttaat caa 503

<210> 367

<211> 477

<212> DNA

<213> Homo sapiens

<400> 367  
gggggacggg agtgagagca ggagcgacgc agagcagccg tcgccgtgcc cgggtctcag 60  
ggcgctggc tgaagtgagc atggcttcag tggcctgggc cgctctcaag gtgctgctgc 120  
ttctccccac tcagacttgg agccccgtgg gagcaggaaa tccacataag tacagcaaat 180  
ggtttaaaac ttgcgctagg ctgtctggaa aactttgttt tttttttta ttatcggtaa 240  
tatttggaag tggaattgca gaacatgctc ctgaacatga agaacctta aaaaatattt 300  
ggaattgcaa cccgaaaaag acgattttgt ttacaataga ctttctctt gtgggggagt 360  
ctaagatata ccatgcatgt ttgactttt taatcgatgt acttgaatat tcattgagaa 420  
agtggacgtt tctgtaaaac ctgaaaagag catcttaata agagattagc ctgtaaa 477

<210> 368

<211> 543

<212> DNA

<213> Homo sapiens

```

<400> 368
gggcagggct cccgcagggc cctcacgggg cagaacaagg agtcttcaca gaaggtcttc      60
agtgagggag acacacaatc cacttacatc ttacaaagat gactctgccca gtgggggtgga    120
gaacagcctg atggggcagg cctcagggag agtagggccg ggaggctctt gcagtcgtcc      180
tgatatgaga ccgtcctgac cctgggtgag ggggtgctgag gcgatggggg gacacagctg    240
gattcaggac attattatga atctcgctac catagtctct catttgtgga atggggggca      300
ggaatgggga catctgcaaa ccagattctg tgcaaaagtg ctcttttcag ttggaactgc      360
tcgatgaggt cgtggggatt gggcttcaca tcttgattaa ttcaggggct ctagaagggc     420
ttgctcttcc acctggctcc taaaaggctc tttgtccccc actacttcct gctgtctcca     480
tccccagccc tgatgtactc tggccctccc gagaggggat gtgcacaggg ctgcaattag     540
tgg                                                                    543

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<210> 369

<211> 487

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

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<400> 369
gagatccggt ctgggatggt ctggggcagc tccttttcac tggacgtgca gccttcatac      60
aggatctcag ttctctcccg ccctccatag gcccatgcct tatgttcctg tcctgcatnn    120
nnnnnnnnnn nnnnnnnnnn nggtgctggg gatgaatcca ggtccaggcc cacccttcac     180
agtctcccca ccattggcct ggctgcttac cagtcactct gtttttcact tccatgtttg     240
tttactggca cctggggatt ttctttttct ctttgacat tcagatgtct gctttgttat      300
tgattcccac atgaaacgct gccttgaaac ccatgcccaa ccatctctac tcactctgcct     360

```

ggatagagaa tatgagactt cctgcttata aattcttttg gaaagttaaa gctgggtaga 420  
 gggaaaagg ggtggccttt gatgtgtaag acaactggaa atctcccttt gtaacacgaa 480  
 tcctggt 487

<210> 370

<211> 511

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 370

gggggaggag gtaagaaata attttgtcca aaatattagg acataatatt aaattaagat 60  
 atactaaatc aatataagaa gagttcatca tagtttagtc agtgatctaa ctgctgtag 120  
 ataaaactat tttatctgcc tactcaataa taaattttac agttttatct gctactcnn 180  
 nnnnnnnnnn nnnnnnnnnn nnnctcatat gaaatacgta gaaattactg cccaaatgcc 240  
 aactacatta tgataatctt ctaaaagtta taattgccta atgttaaaat attttgtttt 300  
 ctgagttatt gccaaatgag atacatccct agttcggaaa gatacccaac tactatactt 360  
 gaaaccactg aagctacaaa ataccttget ctcagttttc acatttgctt ttctccctct 420  
 acagctttct gcagtggcat aagtggatta gttatactat ttttattaat tacttttagta 480  
 gtaattttcta ttaaaacaat tattaataac a 511

<210> 371

<211> 471

<212> DNA

<213> Homo sapiens

<400> 371  
 cacagaaaaa aattcaacag ttaaaatctg ctctcttaaa ctttctaaaa aactaagaat 60  
 taaaattagg agcaaagctt atcccggtga agctacaggt taaagaacta ttaggtggcc 120  
 ttttaagggt acacagttaa gaaatctgat ggttgtaa acatgaagcac gtatctccag 180  
 aaccagaaac aatactgacc tagaagctag actgaatttt ctaggtcaat ttcattgtca 240  
 ctgttttcag tcaaaatgaa ttagtgagtt cctcaaaaat gtcctgtgtt ttcccaattc 300  
 aactgctgaa tgaagtcttt acactaatcc agggactggg gtattttgtt gctcatattg 360  
 aaaactgacc tcagtaaagc ttcttttaaag ttcttagata tagctactaa ctttgccatt 420  
 tatacataga aagttagctt taacttacag caaaacatgt aatcacatca t 471

<210> 372

<211> 480

<212> DNA

<213> Homo sapiens

<400> 372  
 ggggagcttg cgagattgat tttgtcagtt ttcccctcgc tttctcactg ctgctcccag 60  
 atgctacttg ttcagaaata gcctgcatgt aaagagccca cacctcaggc agaatgaat 120  
 ttctggaggt cagaggagct ctggccccag gcatgctggc tgcgccccgt cgacacagaa 180  
 cgcagcggaa gcaaatcagt taaatgcacg gaagtcaatt gaagtatttc cctccagtct 240  
 gtcagctcta tgcacattga ttgggaggac cccttggtgt tcagaagaca gttttgccac 300  
 caaaggccta actcgccctg aaaagtgcgc ttttctggga tttatggtag tgcacggaat 360  
 ggtggaattc agtgggtgac aactgcatgc tgcagccaca aaggacaatg tttgcagagt 420  
 gtgctgcgtt tcgcccagca ccaacattgt tcacctctgt gtctgagccc agacgggggt 480

<210> 373

<211> 444

<212> DNA

<213> Homo sapiens

<400> 373  
 ggggcctggc tggagtcagc gagatgatgg gtcagcaggc attcaggagg gtctggagaa 60  
 agacgccaaag agctcgcgtt aacgaagggc cagtggaaag aatgctatca agaggtctgc 120



tgtgagtggc atcccaagag agggcaattc cacatgggag tgaatgaaaa gactcaaact 180  
gctgctacac aggcatctcg ggggagaccc tgactgcctc actgacgctt cactgtgag 240  
aaacactttt ataacttctg tgtctccttt tgaaatttta agacgatatt aatatatttt 300  
cagtcctaac tacataagca attcatgttt gttctaacag gctgggtaac accccaatcc 360  
tactggcaga gaaaaaaagt gacaccacag tggcacctgg agtctcgag ccgcgcactt 420  
acgtatctca gcagggttc ctcc 444

<210> 374

<211> 499

<212> DNA

<213> Homo sapiens

<400> 374

gttggctgtc tacttctgtg ctctgaggct ggcatacagt ccatttctta tgtgtgttca 60  
atcaacatgg gcttctgttt ttttaaccatt ccatttctc tcccaggagc tgaggactga 120  
acccatggct tcttgggttg gccctcaggg ctggcctcaa gctgtgggtt ttcacttctc 180  
ttctgtgtga tcagagaggt catagtttcc ttaaagcctc tgttgggatt tcccgaagat 240  
cccttctgaa cactctgagc agaagtcagg ctggcctaata gtctgttctg gggccccttc 300  
tttctgact ctccccgtct catccatccc acgatgggac aggaggctta acgtgctcac 360  
cttgagacct ggttttagag gaataggag gccaacaagc aatctgcca ccgttgcca 420  
agactgagaa gatggagggc tgtagggcag tcaggatgag gagaacctgc ggaacataaa 480  
agagaggcaa gggaggact 499

<210> 375

<211> 465

<212> DNA

<213> Homo sapiens

<400> 375

gggggagccc ctgtggcgg ctgcacacgt ggccttacag cattgtgaac ttgggggact 60  
gacagggccc tcatgctcca agctagaaaa ctgttcagt cttggtgtgg cgcataaat 120  
attattctc ctgcaggttt cattaccttg ctgcttactt aaggacacag cttcttctg 180  
tggttccctg ttgtattctg ctaagaggga cagcagcgtc ggatttgtcc cttggcctgg 240

agtctggaat aactagggag agccttgggtg gctgtgttta aacagggctc ccggggcagg 300  
 ctagagatcc ctgagcccg cctgtgcct gctgtggcct ctgcctcttt ctccccctca 360  
 agctttgccc aggggtctctg cacagtattg gtccagacat cctgcgagta tatctccctt 420  
 taaaaaaaag aaagatagcc acgcacattg acacatgcct gctgg 465

<210> 376

<211> 614

<212> DNA

<213> Homo sapiens

<400> 376  
 ggggccgggg gctgctgctg ctgacgctgt cgggtgctgtt ggccggcgggc cctccgccg 60  
 ctgcggccaa gctcaacatc cccaaagtgc tgctgccctt caccggggcc acgcgcgtta 120  
 acttcacgct ggaggcctcg gagggctgct accgctgggt gtccaccgg ccggagggtg 180  
 ccagcatcga gccgctgggc ctggacgagc agcagtgtct ccagaaggca gtggtgcagg 240  
 cccgcctgac ccagcctgcc cgcctcacca gcatcatctt cgcagaggac atcaccacag 300  
 gccaggctct gcgctgtgat gccattgtgg acctcatcca tgacatccag atcgtctcca 360  
 ccaccgcga gctctacctg gaggactccc cctggagct gaagatccag gccctggact 420  
 ccgaaggga caccctcagc actctggctg gactggctct cgagtggacg attgtgaagg 480  
 actccgaggc ggacaggttc tcagactccc acaatgcgt gcgaatcctc actttcttgg 540  
 agtctacgta catccctcct tcttacatct caaagatgga gaaggctgcc aagcaagggg 600  
 acaccatcct ggtg 614

<210> 377

<211> 491

<212> DNA

<213> Homo sapiens

<400> 377  
 ggggttctaag gagcagccag agagggagga agctgccag gaaggaggat gtagggtgaa 60  
 gggagtttca gggagtggac caggtcagat gaggattgaa atgttaccct caggtgtcag 120  
 caatgagcag gtgacctcag tgacctgtc cagagccact gcagggtcat ggccgttagg 180

cagccagaca tagtgggttg aagagggagt ggaaggttaag ggattgagcc agtgggcgcc 240  
 acaagagagc ctgatacagg gcacatgtgt ttagagatga tggacatgtt tgaatgctgg 300  
 aggagtggga gagactgaag atgcagaaac aagaaagccg tttcctcacg gggcgccaag 360  
 caagggatcc tcagctcaga ggtcctcgtt caccaacaa gtgacttctg agtcagggcc 420  
 tgtgctgggg caggagctg tagccagaa ctcttctga aggtccagat ccactggcct 480  
 ggtcaccac t 491

<210> 378

<211> 662

<212> DNA

<213> Homo sapiens

<400> 378  
 ggggtcact gtctagagac tctagaaac cgctccctac tccaaaggga atttgcaaag 60  
 atgatggggc taactcccca gaggagagcc aggagctccc ttttccattt aacacacaag 120  
 ttgaatgcca gatggaccta gatctctgca acacgctgtg tagtggggaa gcctgcgggg 180  
 ctgggtggga tcacttcacc taatgcagca cgtatgccac aaactcacca cagcacacct 240  
 tagcctgcat caaatcctgg ccgctcctgt tctggagaca aatcaccact gttgtcatga 300  
 tgggtgacct cagtcacccc actccaacgc ccacctcacg gctgacatgg catgtggcag 360  
 gaggaggat gtcactgtgc tccagaaca taccataaacc ccatccctcc caccatgca 420  
 tgtttatgct gggattggtc tgtgatgcaa aggtgccctt ggccctctct cgggaagtaa 480  
 tttttcctt catgccaca tggcaaaagg cctgcctctc ttggcatgag aatctctaac 540  
 agcctcagag caagccatgc tgatgatgag ctctgcgtcc tcaactgctca agcctaggtc 600  
 ccagacacaa ctcccaaaag tcaacaggct ttttttttt tttttaaacg aaacaaaaca 660  
 ga 662

<210> 379

<211> 512

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 379

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gggattcaga aagatcagaa aaatataatg actgtgtaaa ctatgcaaca cagtgttccc      60
tgtataaaat tgtataaatc catagagcac catattgata agctttatga gaagaactta      120
tctatttaca taattttattc tcctgttatt agtctactgt ggataataat tttaaaatta      180
ctatattccc ttagggatat tttaactgta agataatttt catggttgat tatattaagt      240
atagaatctt taaaagcttt tctgatttnn nnnnnnnnnn nnnnatttgc ttaaagattc      300
cctagaaaaca tacacttcaa tgtatatata gaaaataact gtgaatactt aatatgtggt      360
attataagcc agttatgcct tgggcattta gattttcatg cttggatttt cattagtaac      420
ctgtagtata actgtatcct ttcttgaacc atgaatttaa gtgccacat tactggatag      480
tagagatgcc catattaagt aaacatcagt ct                                     512

```

<210> 380

<211> 458

<212> DNA

<213> Homo sapiens

<400> 380

```

gggcgtgtgg aggtcactct gctgccggat tctctggtgt ttccaggcag ccttacctta      60
gctgtcctcc attctcatta gacttccttac ctatTTTTTc agttagccat ccttgctgtt      120
ttcatatctc caatcaatag ccctactttc attgagattt tcattaatgt tttcaataag      180
ctcttctcag aaacatcttt tcttaaagaa ctgtgatcat aaagggaccc agaggcaatt      240
gtgatgtcac ctcttcggtt tcctgagttg atatgaaagt tagcactcta taaagtgttg      300
cttgctttga ctccgtattc agggaaaatg tgacagtcag ccaccccagt agagccaaag      360
agcagtcagg atacaagggg agaaatcgag tctactggcc accatcccgt tcccatcagg      420
tgatagccaa ggtccagccc atagacacac ctctgtct                                     458

```

&lt;210&gt; 381

&lt;211&gt; 441

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 381

```

ggggctaccg gactaccgaa cgaggggagg gagagaggc ggagccgag cgtggtcggg      60
gccttccgcg ggtgccgaaa gttgcctctc cgtgcttttg cggcgtggtc tccccctttg    120
cccctccaat gtttagcaat tgattttgtc tgaggattag tcttttagatt gtatcacttt    180
gtgtattttt tgtaaaaata gaggcagtaa ttattctctt aaaatcgggtg aaaatagaaa    240
tgtacgtttt ttgatgaatc ctggtgaaca gggaaatttt tggcacagtt ggtttgagat    300
ggtagaaggt taaaccgaga aagcaaatgt tttgccccct cttcatgaga atgtggcttt    360
gcacatgtgt gttggaggag gtttggccaa aactggagtt cgcgttatac taggccagtt    420
tgtcgtgcc  agttacagcc t                                           441

```

&lt;210&gt; 382

&lt;211&gt; 446

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 382

```

ggggatgggg ggaggagaga tgagctggga ggagccaggg gcctgctggg atctcaggac      60
agagttgcac ctatgaccag tgtaatctgt gcaggcacia tgttctcttg caggccctgg    120
gcttcaggcc tcagtttctt gcctgagaag tgggggaatg agccccctgc ccctgcctgc    180
ccactccaca tcacaggact tgctcatctc ttgccctggt tcatgccctc ttgctctggg    240
tcacttacat tttctgaaag aatcatggct gccttttggt aaaaatccaa gtaaaacata    300
cacatggtta aaaatgaagc tgaaaagctt ataattaaaa gtccctgcta tactccccat    360
totgcaactgt gcaggtaata accatgttcc accagatggg gtgtgccagg cttatgtctc    420
cttctttatg ggaccaatgt caggac                                           446

```

&lt;210&gt; 383

&lt;211&gt; 572

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 383

```

gggggaacac tgctactcct gcccctgctt ttccgtcttt tcctgcagtg ttttggagtg      60
caccctcccc cgctgccttc actctcgctt gtcggcttcc aggcgcggag tccccgaggc      120
ctgagaaacc agtgtcgggg gagaatggga gaattagccc tgagggactg atacgtagtc      180
acggcgtagg agcttcccc tctccccgaa gtccgggggt ttcggtttcg agggctagtg      240
gacctggtgg tagcttgaat cggaagagac caagcataga cctagcgttc cttcccaccc      300
tctccatttg ggaagagtgt gaggtcgaca ggtgctgggg ttgtgtgact ctactgggt      360
ctagatccct gaagcgggtgc ccgggttggc agatccctct gttgtggctt gatgcgattg      420
gttggaacc cggaactgga gactggtttg gattccactg ggagaataga gtttgaaggg      480
tggaaggtgt ggttacctga caatctcagc tcaaggcctc cctcaaactt tattgcaacg      540
tatttcccca tggaagcaga tttcttcttc at                                     572

```

&lt;210&gt; 384

&lt;211&gt; 591

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 384

```

aagaattcaa aaaaagaatt aggacaatta aaaaaaaaaa gaaagttagt tacatccagc      60
gtcttacaat acttgcaaac actgctccag gaccaatgtg atcaagtgc ctttcaggac      120
gagcattagt ttttctatta cagccatgtc agagttcctt ttctttttct gaaatatgat      180
tccctaaaga agtggtggtta agtttaaata ctgataagaa gaaaactctc aagacaagac      240
cccttgcttg tgctaataag gggctttctc catttctggt catccctatg cccaaggcc      300
cactctgctt gaacaggact tatacacgtc ctggccacaa tactcttctt gctccctagg      360
aaagcaagat gtttatgcag gcctctgctc ttccacacca cagcacaagg ctgccaccta      420
cagaatcatt taatccattt cagcactacc caggatgagt gagaatcggc ttaaaaaata      480
atgctggctt ctgctgattt gacaaaggag cctactgtaa tacatgctgc ctggatatac      540
aagttaatt ctctttttag gaaaggcact gatgactact aaaataggac a                                     591

```

&lt;210&gt; 385

&lt;211&gt; 472

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 385

```

tcctttgtca tcccgttgtg aaataagcag tttaaagaaa ttttggttat ctgcctcaaa    60
ggtgatgaaa agggaagggtg ttgaagatTT agcccagcag attgattcct taaggttgat    120
tcctaagggtt gattccttag gaagaaaaag gtgtttgtat tggagctttc tcggaaatag    180
ttttcaaagg agtgcataaa agaagccccc atgcttcccc caaaacacta actttaaaga    240
acctagtTgt tattcggggc accctttatt ttacgttgta aaacatgtag ttttaattta    300
ccacgtacag cagagagaca tcagttgggt agggaatgga tggttatttt ggtgtctggg    360
accctgtgcc ttagaaaaga atatgtttta actgctctta tcatgctagc tcagggtttt    420
aaaatgtgat ctgaataaga ccaaagtttc ttcttgcggt cttttcatgc tg          472

```

&lt;210&gt; 386

&lt;211&gt; 417

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 386

```

gggataaaat aatttTgtgt agatacataa ttataaagtc tcaatgtcaa aaactattat    60
ggaatgggat tagactatta aatgggaaag tacagcttcc tcccctggat acctttaaaa    120
gaggacaaca cttatctgaa ttagatgttc tgatgagaag caaagagtag gaataattta    180
cgagactagc acctagatga tcacagctac ctatccctgc tatcttacag cggtagcccc    240
tatctggatt tgtctctctt cagttatgat gacaagtggg tatctgtcat ggagcggccc    300
aagacttgtg gagatcacco aatcagggtgc agtgtcacct gctatagcta caaactgctc    360
aagggtgtaa gatgggctgc tttgtttttc tctttttctg gacatcatTT gatttgt    417

```

&lt;210&gt; 387

&lt;211&gt; 704

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 387

```

gggaaggatt tgccagagag ctaaactctag atgacttgca tcaatatttg attagataca      60
ttagctggtc gaactctcaa atgatcagaa taaacatgat tatgtcttaa aaacatggta     120
ttaaggcatt gttggacggt ggagtgtatg tgtgcaatgg tttcattacc tgcagaataa     180
tgaagtgttt cttcctgact gaaaaagacc atcatagctt cagctgatgt gctacattcg     240
aaatagcttt agaattccaa gtttgaatta ggcttggtgt tcaatctcag tctatgaatt     300
atagattaca gatagcaaat gactattgag atttttgggt caaggaaaat caaagaagag     360
caaaattaga aatattttta aatttgaaat ctgtctttta aaagtttgat ggattagcaa     420
ttgtatgcc a tgtaattaca atgtctgcag agaagttgaa cttaaaatga ataggaaaac     480
aaacaaaaaa ttgtatgtgc ctgagaaatg ttgcaagtct cagaagcaca catttgtgac     540
aaccaaaaat ggacagattt cattttatttc atttgttcat atatgctgtt tggatgtttg     600
agttgttttc tctttgtact gaaatccaaa ttttccttcc tagttgaaat cctatcaaac     660
tgttgacatg ggctgaatct tatttgattg ctatgtggaa acat                        704

```

&lt;210&gt; 388

&lt;211&gt; 564

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 388

```

gggtaaaggg ggatttctgt atgttctcaa ccagtggtgc tctggagctc aacttagagc      60
tatttttagt ggtaccggaa aaagcaagtg cttaaaaata tcaagtctgt cattgactct     120
ctgtggtcac tagcttgggt tggagtgggt ggcttccttc ccattoccat ttaaatttta     180
ggtttaggtc ttgtgcatca gcacagaact atgatttaaa ggggacttac tgtgtttttc     240
ttttgaaatt gacaccataa tgttattttt gtgcctaata taagtaatta ctatgtggca     300
ataataaaat cattttcaga atactctata agtagctgaa aagtttcaag gtatttgtga     360
tttagcacia aagtaaacaa tgcaaacac tgtaaagtta gagacactaa ggaaataagg     420
tgtacagact tatgtttgct ccaggggaag gggtagaaag gattgggagt ggtgtgaaaa     480
gagtaggatt ctaccaggat tccaaaaaga atgcattgta actctgtgtc aggaatacaa     540
cattaatttc agcatgacac agca                                           564

```



<210> 389

<211> 697

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 389

```

gggagtgggg tggaccatat ctatgttaca gtcagttgcc actttcagta gttcagaaat      60
tatttaccaa gtttctgctc agcaccgggg attgcgttag gtactttgtt ctgagtttta      120
tggatatttag gttcatgcct tatcttctcc attggacaca agcatatttt actaataatt      180
aaaaaaaaa cccaccgtgc cgcaccagat aattatttta atagaataaa aaaaagtaca      240
atggtgaaat gactgaagga aaatnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnac      300
tgttggtggc tgctgtttgg taactaaatg aacgaactga gtccagcctg cttttttcac      360
cgtggaggta gctgctaccc agtaaagtta cgttggttgc ttcagatcca cacttagggt      420
gtagcagggc tgagctagca gtcaggtttt cctgttcctg tcttgtcctc tgacgtggct      480
tcagggccct ggaaggttct ctgctaagca cgcattccaga tgggtgcaat ggcagcccca      540
gcgtgtacac gcacacctcc tgttctgggg gagtggtttc ttggcagctt ctcaagggcg      600
aagggtgagt ttccggcatc tggccttccc ttgtgctgtg gggtcgggtc attctagcat      660
cttgccatct tggatgatct gcagctgtca tctcggc                                697

```

<210> 390

<211> 814

<212> DNA

<213> Homo sapiens

<400> 390  
 gggggtggag gagaggcagc agttcagggc tagattatga tgcacagtat attgatccag 60  
 tcccctggac aaaatcagat ttaattgtcc gtgctaactc ttgtcagccc ttgcccttct 120  
 gtgacaacag gacaaacact aagattataa ttgcaattgg agtttagcttt tâtgtgtgat 180  
 ttaaacggag ggtacaaact aattaatagg ttttaaaaat cttagtactt taccctctat 240  
 ctaaattttc agtghtaatt gagcaagtat tggtaggtgg taaatggaga cttgccagat 300  
 gttgacattg ggcttggatt ttgaaacttc ttccaaccag gaatttaatt acctggttgg 360  
 tgttgggtgt tgctttggtt tcattttacaa tgttaaattt ttaacaaatc aatgagagtc 420  
 taatatggct atctggattc agagcatacc tcatttctgt tagcagctgt gattctcagt 480  
 gtaaaatctt tcagtttcta ggtaaacaaa gaatagtttc tttcggggca tctaagggtc 540  
 gattgctgtt tcctttgact gtgtattaga cagagtgttt tgggctctgg tcaactttag 600  
 tagaaaacct agttttcata catacattta aaactgaatt tatggaattt gactgtggtg 660  
 tattttacatt gtgagtggag taggcaaaag gatcttttaa caaacaaaat atgtatttac 720  
 ttatatgtgc attgaaatat gtattttccc atatacatct gatgtcctga tacaagctt 780  
 actttttctc catgaaaagg aaataaaaaa cacc 814

<210> 391

<211> 505

<212> DNA

<213> Homo sapiens

<400> 391  
 gggctgacat ggagattcaa ggcccagggt ctttcagacc ctccatgacc cacatcctcc 60  
 actattcaag gccaatcca aatgccattt ttactggga gâttaaaatt actgactctg 120  
 tagctctaaa ctgctgtta agagagagca actcccatcc aagcgcataa gggcctgcc 180  
 acggcccagt tcctccactg ctcggaatag taaagataat taaataaatc gtctaaaaaa 240  
 aacactcctg ttaaaatttc agtggctgct tttctccatg ttgagttccc tcaggaccca 300  
 gcatgtgtta tttttaatta ataatgacat ggtttattac aggattcctc ctatataaaa 360  
 caaattaaca atctttctgc aagggaagag gaggaaggct ctgagttaaa aaagaaaagg 420  
 tggatctctt ctttgaaaag gagagggtaa ccctaagttt cactgaggca tttatgagca 480  
 tccttttttt tttttttttt tgaga 505

<210> 392  
 <211> 705  
 <212> DNA  
 <213> Homo sapiens

<400> 392  
 ggggaagagat tatgagcaaa aataagttcg aaatgagtat tttcccttgt aacgtaatca 60  
 gtttgcagaa gaactatatt aggtccttta ttccattagg agccagggct tacaagcttt 120  
 tcaaataatct ctgacctaaa aacaaactga ctctaaaata caaaaagcaa gctgtagtat 180  
 ctaaagtatt ttttaacaaa tgtcttccaa aatggtgaac aggtccactg gtataactcaa 240  
 ctcttaagct cccacatgtg ttctagttaa tatggggtaa atacacattt ctatgacatg 300  
 attttgggtg gggcttcaca aggaaggatg gcttggggga ctgtggaagg ccgaaatggc 360  
 cctagacata tatccagtta ttgcttgat ttggaacaga tagagataaa atgtaaaaca 420  
 tcatcagatt tatggggaaa cagcaccacc ttgagcataa aattctggac tacaactgag 480  
 ttacatttcc agagtatcag ctataatcag gtttcacaaa ctataactga agtaatttat 540  
 tcagaacatt atacctctat atactatact tacaccaaag ggggagcttt aagctgttct 600  
 atatatcata aaaatatgaa tggtaacatc tctaaactct ccataggact caacgtttat 660  
 aataaaccag acaacacaaa tattatgaat taatttatct gacct 705

<210> 393  
 <211> 585  
 <212> DNA  
 <213> Homo sapiens

<400> 393  
 ggggtgaagtc cttggggaga aaaggagcag gccaaaggcg atgggtggagt agagctgcct 60  
 ctgagaggca gcatgagctg agaggggtgat aggaaggcgg cgctagacag catggaggac 120  
 tttctactct ccaatgggta ccagctgggc aagaccattg gggaaggagc ctactcaaaa 180  
 gtcaaagaag cattttccaa aaaacaccaa agaaaagtgg caattaaagt tatagacaag 240  
 atgggagggc cagaaggatg gccggggccc ctttggaggg aaggagggag gactggctga 300  
 ggtgggtggg tgcttcctcc tgtttgtag aacgatcatt cgatcattcc ctgctccgcg 360  
 tggcctggaa ccaagcaagc ccgatggcag ctctggagtg ggtcagtggtg gaacagaggg 420

gttctgggag tccaggaaca ttacaccccc ccagaatgca agatgaaagt ggcatgaggt 480  
 gaaagatcct cagaggcaaa acctgagcca ggctttcctt tccggcaggg gaacagagac 540  
 tggcagaggg cacaaccagg gctggtagag aacaagggct ggtgc 585

<210> 394

<211> 583

<212> DNA

<213> Homo sapiens

<400> 394  
 tcagttagga atgcttcaaa tgagcaggaa ttttatcgac tgaacaagc aatgattaga 60  
 gcagagcttc acacgttttg agccagtaca aagttcatga actctatctt taaaagaata 120  
 aaacctcaca taaagtaaag cagtcaactt gtcagtcaag gcaatcagta agaggaatag 180  
 taagagaaac tgaattgaca ggaaccotta ttcttaatat ttgccctat ccaactttta 240  
 cttaaaattc taaaactggc tatttcgact ttacttttct aaccttttct gtttgtcaaa 300  
 ttgacaggat cactgaaagc aattataaac gcacacaaag aaaataggag gacatgtgaa 360  
 gaatagacat ttataactgg gttgaccaag ggcccgagtt cccacttgac accccatggc 420  
 gaaactgctt gttgcactcc agtacatcaa agcatcatgt gctcaatggt gtgatagtta 480  
 gaaaagtcat agtacacttg ctactatac atttgctaca taaactgcct ctccaggagc 540  
 acaaagggtt ccaagaactc actacatgaa cgctgatagg tga 583

<210> 395

<211> 489

<212> DNA

<213> Homo sapiens

<400> 395  
 gggggggggg gttgtaaaag tcaattatgg taatggttgt gagaactgag taagagtagc 60  
 tgaccttgga atcacagtaa caggaggaag ggagagcat gtgaatgtat atgaagggaag 120  
 ggaggaaggc agaggtgga acttgaggca gttctcattg cttcccttta ttcaattagg 180  
 cagcatggtg accagcagag tgaggaaagg agatgaaata gagaaataaa gtaagtatac 240  
 ttaatgggca ccctggcccc acctatgatt tgtagccatg agtttaaaca taataatgac 300  
 tgtacttttt cagccaaatc tgggtggtgca ggacacagggc atggagaagg ctgggtctaa 360

ctgagggtggg atcacacaaa gctacactca tgagaagcaa tacaacacag gacacggttt 420  
atattgctga acaccaatat gtcactttat tatttggatt ttttttccca tttgtcacat 480  
acctgtcaa 489

<210> 396

<211> 503

<212> DNA

<213> Homo sapiens

<400> 396

gggtggccga tcacctcaat cttattaaga gcttaatcat cttggccctg tttcactgaa 60  
acagatTTTT aagaatcctc ttctggtaga gacaactatt ctctatccat atgttataat 120  
acatacatct gctataacta ttcttttaaaa ttaaccccca ggaaactgat tgaattagcc 180  
cattaaatga tattaactat ttttattctc catctgacca ctggagctca tctgaccatt 240  
ggctcaaaat aatgagcttt gttttggcat agctgttggg tttttttcac cataaagata 300  
caacactttc tgctcattcc tgactcttga caataaattc atgccattag caaaatctta 360  
atgattttcc tatttgctgt aaaaatatta agtatctatc atgcatacct aaaagcaaca 420  
tgaggattatt taaccctaag tggaaaagga agcaggacca tgtcaaaaaga cctatcacat 480  
tccttttgat attgagcaag cca 503

<210> 397

<211> 490

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 397  
 gggagacttt cacgtgggcg tggtttgtag tctgacccac tggtagacttt aaacaatttg 60  
 tcatcaaata ccacagttgg ctttgcagct atctgggtatt tgtgcctgga gtaggtttgt 120  
 ttgttttgtt ttaaattgctt ctaaattaca attctttgtg agcttcctgt ttcctactta 180  
 cagctgaaat atgtgatgac tgactctacc aggactgctt ttttcccctt ttctgcattt 240  
 gtgctggaaa cagaacagct tgcacgcaca gcctggagca tgttgcctgc atgtgcttct 300  
 tggtaggacgt gagcannnnn nnnnnnnnnn ncaaaaaccg cctattttata tcctcttcag 360  
 aagcgtgtc agacattaag cactctctct actaacgtca cgtcgattaa tatggatttt 420  
 aaaatggaag taaattattt tttactcatg ggtgagtcac tagatagttt tttttaaata 480  
 tacatcccac 490

<210> 398

<211> 428

<212> DNA

<213> Homo sapiens

<400> 398  
 ggggaggagg gtccctgaat taatgaaggt gggtttactc taagggactt tgcttacaca 60  
 attcgcttca ctttggaatt cactttgagc tggatatact ggtgtaccgg tattgtcgta 120  
 ccggtattgt accaaagga ctttaccgac tgcttgattg gcttctgtat atggggctag 180  
 gtcagagtta acctttttac tgcgcgccta gacctatctc aaaaacaaac aaaaacgtta 240  
 acgttcagtt ccttaaatac agagccggag aggggtcatc cctaggactg agattcaagg 300  
 ctgagaggat taaggcgggg gccggaggta atctgaggca aggagcggag cccggggagg 360  
 aggggtccctg aattaatgaa ggtgggttta ctctaaggga ctttgcttac acaattcgct 420  
 tcactttg 428

<210> 399

<211> 470

<212> DNA

<213> Homo sapiens

<400> 399

```

gggccggatg caaagagaag aaagagaagg tagctggaag tgcagagggt ggtgagatgc      60
tgtttatattt aatgagggga ttttgagttt taggcatgag gtagagaaag atgcgcttag    120
agaattagca aggaaataag atgggtagtt agagaatgta aatggcctgg aagagagtag      180
tgagtgaacc aagtcaaagt gagttgggag cggaggaaga cacttgaggg ctgaaggaat      240
aacatgtgca aatacttcag agcaataagg aattatagtc aaaaaactga aagaagtaca      300
ttataggtag aatttagagg tctaaggaga gaatagggaaggaggagataaa aagtagaaaa      360
agatgaaact cggctgtgat gggtttttcc ttaatttttc ttttttaaca agtgacatca      420
gatttacaat tctaccagca tcacttggtg attgattgga tgatggagtg                    470

```

<210> 400

<211> 556

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 400

```

gggcaagggc agtccctagg caccactgtg tctcgccca aagggcatct caagagagtt      60
ttgcagagtt tcatgtaaag gatcattaca ctactaataa atatgggtag tgacttcac      120
agaaagagga tgagccacat caggtgcctt gggccaagga gctggcgga agaactgcta      180
tatttcctta actgaaggca ctgacaacag ccagcagaat taatccatca actgctctct      240
ctcctctctc tttcttcccc acttctnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn      300
nnnnngctgg cgagggccca ggaccagagc accaagccct ccaatgccca tgtgcaggaa      360
gggcagggtc aagctgctcg gcttctgtt gaagtccgc tcaggcattc ccaactaactg      420
atcaggatac actcacagtt caccgcgaag agcagacaac aaatgaggag agatagggca      480
acggcacctc tcatgtctgc ttttttgtct gcagcatttt taaaaatata atttacatga      540
tacctactct ttcaaa                                                            556

```

<210> 401

<211> 496

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 401

```
acagcattag gttgtttggt gcttttattt ctctactttg tttttctgta cagtgcagta      60
tgagtcattg catttctcgt gggagaaaag tcaactgtatt catcactttt nnnnnnnnnn    120
nnnnncaata ataaaagaaa cattcaagga aaggaaagtt tggacgactt ttgtcatgca      180
gccaatgaga attgacaaat agggatgatgc ggaattaaaa cttacgtcta aaagaactat     240
taatattctt agtcctcca agtcctatta actaggaaaa tctggattta gaaaagaaaa      300
aaatagaatt taatgtaaac aagtactgaa tgtatgaagt cctttccaaa cataatagtc      360
ccacaaattg agtagtatta gatgaattat tagttgcagg atatgtaggg gaaataggtg      420
aactagctta aatgggagtc tgaagtagaa agtgataaga ttagtagagt cagtttttta      480
tgaatgttct tagaag                                     496
```

<210> 402

<211> 497

<212> DNA

<213> Homo sapiens

<400> 402

```
gggaagggaa ggattctgga gaaaggaacc aagagaatct agaattctaa aggaccacca      60
ggggctccag gcctggcagg agcaactaac aggatgacct accttcccca acttacacca     120
```



```

cctcaggcgc tgggcagatg ctctgtgact ttatcagtat ccotggggag tggtgccagc 180
cccaggtgct gagctggagg ggggatcaca gaggaatcaa gggactcaag gaggaaggc 240
agctggaggg aaggggcttg ggcagaacga aagaggaagg ggcttggccc tgggctctca 300
tccactcctg aagcccatgc ttggaacagt gaatgatgca gtgcctgtgt cccaagggtcc 360
cagcctcgtg tgggaccatc ggggcactag cagccttcct gtctcctacc ccttgctctg 420
ggggccaaaa ctggtcctgg aaatatctgt tctttaaaat gtcataaac tctcagtaac 480
ctatctgctt tcttctg 497

```

<210> 403

<211> 596

<212> DNA

<213> Homo sapiens

<400> 403

```

gggtatccgc agggacagat acactctgtg tatccttaaa acaagtgcaa ttgaatgtcc 60
attggcctaa agggcttaga gccttcatag cagggccttc ctcagtgtat tcaattcggg 120
ttaattttgc tgtctgattt gcaaggattg gtgttgtcat cttttacctt ggctttgtcc 180
aagttccagg gtttcttaga aatgccgttg acgaattcac gggcagagcc agaattgtctg 240
tcttttaggca ttcttgtctg cacagaaaaa taggtaggtt aaacatgcaa ctttttatct 300
aatgtggttt tgttcttgtt aatggttcct ttattttgac agttcagaaa tgtccagaaa 360
tgacaaagaa ccgttttttg tgaagttttt aaagtcttca gacaattcca aatgtttttt 420
taaagctctc gaggtgaagag ttgaaaacat cttaataaccg tgaattcatt ttcttgtttt 480
taagtgtttt tgatttggtg ggctttatgt cttagaagta gatatttcac tttcataata 540
atztatagtc ctacattaat acagatatat cattatcaca tatttttgaa ttgate 596

```

<210> 404

<211> 568

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

<400> 404  
 gggaggcagg ggcgccgag ggtggttcgc acacgtggac tcaggcggcc accgccgcgc 60  
 tggctggtaa gaagccccac aggatctccc aaggagccct gggacagtgt ctcagaacat 120  
 ccacctgggg caagaatggg gactgctgtc cccagggggc aggtggagcc tagtgggcat 180  
 tcatgaccca ggttttggag ctgtgcttgc gagagtggct cccatgggtg tcccaggga 240  
 gcttggagcc aacgtcccta ggcattggcct gggggtttgt gggaaggcct gaggcaaggc 300  
 ctgtnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnagcaca 360  
 agagggtgaa ttctgagcag caccagaggg ttccctgac acagcagggg atgctttgag 420  
 gcccttttaa tgaaggagaa aaatgaggct tagagaaagt cagtgccac cccaagtctc 480  
 atgggccccca ggctgtgggc agtggctaaa gacaggctag tgggtaactc ggggccacgt 540  
 ggaaggggag cttgtattta tagcccc 568

<210> 405

<211> 474

<212> DNA

<213> Homo sapiens

<400> 405  
 ggggctgtcc tgtgagaaac acatgctaca ggccaacaa caggaagagg ataaagggat 60  
 agtggcctca ctggagtcac caggacagcc ccgtggtaaa tgatgtgata gaaaaattct 120  
 ccccatctac ttgtgctgag cctttccttt cttggagttg tagtttctct tttgctgaga 180  
 cacctgttgt cctcaagttc ttctccaggc ctctctcaaa attccatttc aaatacctaa 240  
 ggctaagtgt aaatattcaa atgaaactgt caaaatttac taagagatat aaataaaacc 300  
 ttgcgatagt gagacatact ttcttttctg aggtggaagt cttactagtt ttaaattttt 360  
 tgttcgtccc aaattaatat agatataata tacaatctta tcaaattccc aataggatct 420  
 tctggaggaa gagaagaaat atttaaagtt cacataaaaag atttagggtc cttc 474

&lt;210&gt; 406

&lt;211&gt; 522

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 406

```

gggaaaaaaa tgggtgtgctt tagggaaagg gggttgaggt ataattttct gaaacgtaaa    60
gttattttca taaaaaagaa atctttcaaa aacttacttt ttgcattaaa gccataatta    120
tgaaaacaaa ctacacatag tacatgatat gaattaagta ttgataaaca gacttacttc    180
ttctctaaac tgaagaggaa tcatttcaaa cttcttaaaa atttcaatcc tagaaatttc    240
ttaagttttg gataaaaaca gttccacttt catctttctt tttttgtaaa tcattgttca    300
cctggatatt catgtaattt ttaaaaatac ttaaataacc acctttagct agagtcacag    360
aacaaaaaaa aaagagagaa aacccacaa atttaaattc tcagcttctg ttaattattc    420
atgatcaacc acagtcttca ttaatacata tatgtactga cattttaaac ctatttgaat    480
tgcatatgat actttaaga ttcacaagaa tttgcctca aa                          522

```

&lt;210&gt; 407

&lt;211&gt; 501

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 407

```

agcattaagg gcagtccaga gtactgtgtc agcacataga agggacatct gccccacatg    60
tggggctttc aagaaaggag tcttgaagga agtcttatct aacgtgtgag tcttggaagg    120
ctaggaagag agaaccaagc acagaggggc caggggggaa tagttccagt attgctaaca    180
ccgcatgcaa aacctcaggg ctaaattcat catatcatat ccaaaggaga ccaacaaaca    240
ccaagtatta cagttacaca ttttcatgta acaggtaatc ccaaattta gtgacttaaa    300
atgtactaca caccagcaga tcagtagcaa taactactca gcacctgta cgatgcttat    360
tcgatgcaca ttcaacttca gcgaaataag tcactttcag ggaaaaagta gagcctttcc    420
tctttgacct tctgccagta caaaagctta tgggggcagg gaataaaca tcaaataaaa    480
aattctagca aaatatgaca a                                              501

```

&lt;210&gt; 408

&lt;211&gt; 558

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 408

```

gggggatttg cgatgcagct cacgatagga gtcttcaaac acatggtcac gacggacatg      60
cacagccatg tcttctttcc ggagccctca tctatgcaca tctcctcaag cctgccccct      120
gacacacaga agttccttcg ctttgcagag actcaccgca ctgtgttaaa ccagatccta      180
cggcagtcca ccaccgctct tgccatatgg cccttttgat gtccctggtag actacattag      240
cagtcctoga ctttgatgtc aagcgcaa atttccgcca agagctggac cgtttacatg      300
aggggctccg gaaagaagac ttggtcgcgc acgaccgccg aaacactatg ccaatcgaca      360
ctacacgcga gaccacagc aacccccggg ctctgcatcg ccgcttcgcc ttccgccgcc      420
cactccccct catgcgacaa tggcagcatc tacaaccctg aagtgttga tatcacagag      480
gaaactctgc attctcgctt cctggagggt gtccgcaatg ttgccagtgt ctgtctgcag      540
attggctacc caactgtt                                     558

```

&lt;210&gt; 409

&lt;211&gt; 534

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 409

```

gggggtctct ccagaacccc cttcgatcct gagcaccccc tcatccccct ctcaggtggc      60
gcctctggag ggcaagttgt ggggcaccca gaaacctcac tgtggagtct gccgttcaga      120
gtgaagccca gcccgacctc tctgcgtcct acctatgtgc tgtgcctttg ggcaaggggc      180
ttccctttcc ctgtctacag agcggcaatc ataataagagc ctctgtctca gagtcgccag      240
gaccactggg atatcctgag taatacctgg cccctcccag cctcccttcc tttccctgaa      300
aaaacaggtc cttgttgccc tgtgtgagtg gactctcagc aagtggaaac ctcttcctca      360
gcgtgacgtg gaagtccttc ctgtacagca tcttgcaagg aatatccctc tagagtgaca      420
gcttgttatc tctgcaaatg cttcaagcct caggatcccc acatttcctc tgggtgcccc      480
gctgagtggc tcaggcaagg agcatgctgt acgtacgtg acaccagggc ctgg          534

```

&lt;210&gt; 410

&lt;211&gt; 441

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 410

```

ggggaatcaa atcatggcca ctgttgtcac tottgacatt aatcccatac ttaattatgc      60
ccaatthttat gcatctaagt agccaaaaaa gaaagtttct aataaacatc tgattaacgg      120
taagacagtg atataaagcg tagtgcaaat aacctggat tagggtaggt gatcagcaag      180
agcttttcgc tctgaatttc aggacaagta acacaacctc agcatgttct cttttactgt      240
aaaagggata cgtgttatca cccacgtaag actgaaggaa tgtaaactat taaaccagta      300
ttagagttct taaatgggtc aagtcataat cattcaagt ttcaattttt ttttaacacc      360
aactgcacat aacaaacttc tgaatgtcca aaacttctg aaacatttac gtcatttttc      420
gttcattaaa agggcagggt a                                     441

```

&lt;210&gt; 411

&lt;211&gt; 473

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 411

```

gggacaggct gggtcagcat tcccagcagc acagaatagt tgctcagtgg tgctggattc      60
cctgccatct tgccatttcc acagtctcat gggggttggt tgatttctga ccgctgctgg      120
gacctgtggg atgagcacag gcaggagagc cagccaggcc acttctcaga atgaaactcc      180
aggctttgta gagcttctgc tctgctcagg caggacaaac ttgcatcttg ggcattttgt      240
gtccacctga taggtcacat gtacagtgtt ctcttgcccc attgttgaga tagccgtgtg      300
accaggttc ttagaaacca ccagtgtcac ggcctagcaa tgggtccagc ctgctcatag      360
gagaatccct acatatacag gtgggaaatg aggtctcttg gagaatagta ctactttatt      420
gggtttaact agaggaaggc cactaagaat tagtatctgg tgtggattaa tac          473

```

&lt;210&gt; 412

&lt;211&gt; 485

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 412

```

ggggagagga ggaggggacg gttcaatccc agctcaacac agcacgggag cctcagggaa    60
ggctcctcca cccaccctgt tgctggaaac ctgagcagcc atcctgaatt ttctctttcc    120
cctgactca tccccaaatc catcagtagg tcccactgat gacacttcca aacaccctcc    180
cccgtgccca ccaccagat gcaggcctgt catctctcac ctggactgtt ggggtggcctc    240
ccgtgcctt gctgcctct ctccagctgt tctccacaga caacagccag agtcgctttc    300
aaaacgcaag cagcaccaca gcctccccac cgctgaaact cttcagtggg ttccaatgca    360
ctgagaatca aattctaact actcatgatg gcatgctcaa aaaggcgcat gatggacgtt    420
cagttcagta attaagtga gaaatcaact gaattggaaa aaaagataat gacttttaac    480
gaaaa                                           485

```

&lt;210&gt; 413

&lt;211&gt; 632

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 413

```

gggctgacct ttccaaaaga cttactaaa tataaaagga gaacaaaaga aagctaaaga    60
tagggcgtgc aaagaataaa aacagcctgg ctacaaaaga acaagttact ggtttgtttc    120
caaagctttc ggaccctgcc ctgttattcc cttccagga gataaccacc tccaaggcca    180
gcagacttct gcaggccctt tcgccaggct ctctggcctc ctagtgctgg cttgtccact    240
gtctaggttg tctttagga cccatgccac caggaatcct ctccagacta cttgaccacc    300
ctgcagtcag atctctgttc tgccctcttc totaccagg gctcttggct gtggtggcgg    360
agggagggat gcctgtttcc ctaggtctcc caggtgattg gcacctatgt gactggacct    420
tttaggagtg cagccttggt ccatgtaggc cttgtaatat gacctacctc ttgccatgct    480
gtcaggcca gtttagccca cgaactgcc acaaaaaggc tttctccaac atttgatctt    540
ggcgaaact atagaagtct cccacctgg ttccatctc cactggggcc acaagaatag    600
aaactgataa gaagttggcc tagttgatgg aa                                           632

```

&lt;210&gt; 414

&lt;211&gt; 755

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 414

```

ggggggaatg agaatacagg gttgctgcca tatgttattt acaatgccca attttcaaga      60
acagtaacaa aatatgagcc actcaaaggc agaggacact gtgacacatc cactggaaaa      120
tggatgagca ctagggagcc agatgttttt atttagcaaa tcatttgcta taaatacgtt      180
caaagcatca aagaaagcca tgtctaataga agcaaaggaa agcatggcga taattattta      240
tcaaagagac tatcaattca gacaaaaatt attttaaaaa tcaagcggga attttaagt      300
ttaaatgtat aatagctgaa gtgaaattgt tactaaaggg actcgagaac agatttgagc      360
tggcaaaata agcaaacttg aatatagaca aaaattatgc aacctgcaga aaagaaagaa      420
aaagaaataa aaaacaaaca acgcctcaaa gacttgtaga acaccgtaaa gcatgagaaa      480
cttttaccaa catatctaag aacctaaaca aattcagtag aacaaacaga aagggttca      540
tactgagatg tattataatc aaaccatcga aagccaaaga caaagaaata atctgaacga      600
gcaaggataa atcaaaagat tttcactgca tacagaggaa cctcaaatat caatagctga      660
ttttttacca aaagccaggg ggtggaagac agatcagata acatattcaa agggttaaaa      720
cgatagcagc aaacactctt gtcaaccaa aattc      755

```

&lt;210&gt; 415

&lt;211&gt; 434

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 415

```

gggttctctt tctgtgatgc aaggatacat cgctgcacta ggctctctga gaaatttggt      60
actggctagc aattagagtt gagaatgtaa actggccaca gattgaggaa ttccaggcta      120
gagactgtga gccctagtga agaaatgtag ggtcagggct caggaggctg ggattaagcc      180
cactgctgac agaattgatg ctgagacctt cagcacatca cattatcttt gtttcctctt      240
tcagatccag agattcatga gcttttataa gtggaaaaga tttagatgtt ctaacatttc      300
ctccaaatgg gagattgcaa ctttccaaaa tccttggttg atggttctcc agatttatct      360

```

caacagttct agtgctggaa ctttttagctg ccatactgtt gaactttagt gggccacatt 420  
 tacatagcct gtgt 434

<210> 416

<211> 454

<212> DNA

<213> Homo sapiens

<400> 416  
 gggaaacccat gcgtgacagg gtagatttgt gcagcatcac aactgaaaaa cacaggtgtt 60  
 ctttgatcca gcagctcctt ccgagagcaa acacacacat ctggtaatgt gcaactctagc 120  
 acgggctgcc acggcaaaaa tctggaaact gctgacgac tgctccgcag ggtttggtcc 180  
 aatcagtcac agcagattca caggaagctc acaatgcaac ctttttaaaa gtgacttatt 240  
 tgcattgtgt gacctagaaa tatgtctact atacatgggt aggtagaaaa attaaaaggt 300  
 acagtgtca aagaatatgc ccctagtttt atgaccagaa aaaagtatac actacctatt 360  
 tatgcatgta tctaggttat tctgaagaca gcctaaattt cattgcattt aagatttgtc 420  
 aaaggtttac ttttttcac agttcaaaat tcaa 454

<210> 417

<211> 499

<212> DNA

<213> Homo sapiens

<400> 417  
 ggggacgaag aggtatgtgg ctcatagggc tgtgcctggg tctcccgac atggtggctc 60  
 tcgcctgaag tgctgtgtt ccttgtagcc cgtgtggctc tgggatcaag atcgtgtcgc 120  
 tccggcagcc cctgaggggc cttctccaga cttcgctatt aaaatgctct ttaaggcagg 180  
 gagggacagc aggtaggaag gagttctggg ctgggattaa gagtgcccct tgaggaccag 240  
 ggacctgttg tcctctgaaa cagaactgca gggcttcctg gacagtgggt agaaggaagg 300  
 ctgagcccag cccacagcc tccccgagg gtggagatgt atcatgggat aaatggcagc 360  
 cttttgggat cccgctgtgg acagggcgca gttggtgtgc gccactcccc actcacactc 420  
 tcttcctgtg tgaacagaaa gactccagct cgtcgcaggt ctgggaggga cccgaggacg 480  
 cagggcatag cggaccctg 499



&lt;210&gt; 418

&lt;211&gt; 579

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 418

```

ggggaaaata tttatagatt gttatactga cctcatccct gggcacatta ttttacgtat      60
caaaatgaat tggggaacga ggccttcagg ggtcaaaaaa aatccttaaa atgagttaaa      120
cgacatgcac aaataatttt caaattattt atgagttata atcaaataa gacacttact      180
ctgccattaa attccggact ttattggcaa aaaggacagg atcatttttt tttcatcat      240
ttggtacctg aactggcata aactgaaaga caaatatacc tttccataac aatgtcttaa      300
gcctaagaca ttaaatgcc aagtaaattaa tttatacatt atcaatatat tgaatcatct      360
acctttctag aacatagggt atatgaggta atggggcact gggcttgtag tcaggagatc      420
tgtttctaag ccctgagtct gcttggtgtg taactagtat gtcatttaac tttgatgaac      480
catttcaact ctaaaaagag ggctaagatc actacttccc tggtgattgt gagggtgaaa      540
caagtcagtg tctggaattc tggaagtgt aagctgtag                                579

```

&lt;210&gt; 419

&lt;211&gt; 674

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously  
 y

&lt;400&gt; 419

```

aaacggtgtc atggagctaa gaaagaagtt tactgaagag tagtcaaaag tatcaaatat      60

```

```

tcccaaagga ctgtttaagc taagaacaga aaagcagaaa aaaaaaggta taattcttgc      120
tttttgggcg cctatacagt catcattact gttaacattt tgggtgtattt tcttctagcc      180
tttacatatt atgcatgata tgtttttatt attctttttac ttattctcta ttttgcaagc      240
tttctttcat gcaattactt ttttataata aactttttct aaaagtaaaa ataaatacca      300
nnnnnnnnnn nnnnnnnnnn nnnnaaccag aaaagtattt gttagtgttg gcttttagga      360
agaccaggat gaccttggcc gtggtggaag aagtcagact atgaagacag gtgagaaaaa      420
gaacaaggaa atggagacag ctcttaatag aagccagaag gaaaaacatc caggagaaat      480
ggagtgaaag gattttataa gatggttgaa acttaattac atgctgggag ccaagaatca      540
atagagaagg aaagggtgaa tataatgaga tggtttgaag caataacatc tctgaggaaa      600
tgaggaggag cagcactctg cctgattgtc ctgtgataga acagactgga ctctctaca      660
gcctctctat ctat                                     674

```

&lt;210&gt; 420

&lt;211&gt; 440

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

```

<400> 420
gggtggaagt ctcttattct agtttacaaa ttatacagcc tctgactccg ggctaggaaa      60
gaacgtctgg tttotgaata cataatatgc cgtattttgt tctttggagc ttatctgtac      120
tacagggtgtg ctactgtgtc catctagtcc cattatttaa aatgcaaatt tgttattcta      180
aatttagacc aagagattat ctccattagg aaaaaaatca ccgcatattc gttctttaaa      240
ttttcaaaca ttatttaaga ctgttgtaac ataataatat aaataaaacc ttttttcatt      300
actaatctgg aggctcatta cgtacggata aatgttcatt gttgtgtcca gcttttcctg      360
atgatacccc ttgaactctt acattaatat gcttatacac taaagtcaac atctatttta      420
aaatagaact gaaaaagatg                                     440

```

&lt;210&gt; 421

&lt;211&gt; 431

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

<400> 421  
 gggggaggga gttacaagtg attccttaaa aactttaacc aattattttct cattttttatt 60  
 tgttgctgtt gttataccaa taattaggag aaaaataaaa atagaaacta taaaaagaga 120  
 aagatatgag actagaattc aattttctaac acaaatgaca tttagctggt acgtatgcaa 180  
 gatcatactg ccctccttat ctttaaaatg tggatatagga gaaaacatag aagtttagatg 240  
 tctagaacaa cagcatcatt accgtttagaa atatcatgga actccccccc acacacacaa 300  
 acacaaaaag ccattgcaaa gaatgctaata gctcacagtg tacagcaaag gcatcaccaa 360  
 ttgctgaatt ctgggttttaa gtataatgca gcctctcgct ctgatcagaa ccagaaatgg 420  
 aagccaggca a 431

<210> 422

<211> 406

<212> DNA

<213> Homo sapiens

<400> 422  
 gggtagtgac tgcaccgtcc ccctggggca tgtgtggtgt attaaaaggc cgaagaggtc 60  
 tcctctgggg gagatcatga gacggatata ggatccagac tggttttttt tttaatggtt 120  
 ctaggggtaca aaaaaaatg gtagaaaaaa aagttttacg ttgcagacag tgagtaagag 180  
 tgactcaatt agacattctc tgcttctctc tcagaagaga ggggcagcag gagtgaggct 240  
 ttatggggaa ataacctggg ttccacgca acccataagc agctcgtggg actctgagca 300  
 accactaac ttctctaaga ttattttgag ttccaaaatg agtgtttagt catgagcttt 360  
 taaaccttct gcttcaagga aagtacttac aaaggactga agtttc 406

<210> 423

<211> 486

<212> DNA

<213> Homo sapiens

<400> 423  
 gggaaggaaa ataaagagat agaggtgaaa gtacatcttt gctctggttg gtcaagcatc 60  
 ttctgaatc acctgtcgct cctaataaac tgcaacaaca gcaccgctga gcgtgaaaca 120  
 ctgtggatag acagagaagc tgaagctttt atactctata ccaaataaat gtgatgcaga 180

```

gtacaaaggg aaacagcagc taagcagaca ggtcagagaa atccaatttg atgtgtaagt    240
aaaaaaagaa ctggcagggt ctggaaaaat ctagcttttt aggaagaaat ggaatctgag    300
gaggggcatc ataaaagact aaggattcac ctcccttctc cctcttcaat atcatactat    360
caatcttttt tgtaaatggt agaaattcca caagctcctt tccctcctc agtttcatgt    420
actctctagt atatatagaa tccattatgc ttattcctat ctttctatct ataatctgct    480
gcatgt                                           486

```

<210> 424

<211> 466

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously  
 Y

```

<400> 424
ggggtttgcc tgaatttcaa atttaactgg ttatcctgca ttttatctgt caaccctaca    60
cacaaatcct taaggctctg agttttcatg tggagagttt tctcattcag tgnnnnnnnn    120
nnnnnnnnnn nnnnnnnnna cacataagcc tttagaaaac ttgcttaacc tgcagctaatt    180
aattcatatc gtagagttgt catgaggatt aaatggagaa aatgcaaata aatctagggt    240
caggttagga ttcagcagct gctcgaaaat cattaggtaa atgtttatct tcttttttcc    300
tctcaaactt atttcaatgc tttcctaacc tttccaggaa gaataaggag ctccctccct    360
ttccctttca acaggctgta cttctttctg ttgcagcaac ctacatgggt taaggcttgt    420
tttgtaataa tgacatagac ataccaatct ctttcttgtt tggggtt                    466

```

<210> 425

<211> 462

<212> DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 425

```

ggggagcagg ccttgctcctg ccagggtgctg acagagacca caggctgagt ccaggtttcc      60
ctagaaggga accatggact agagacaggg cagtttgagc atcaataaca acaatgacca      120
tgagggtcag aaacaaccaa caagaaatgc ccagcaggtg ctgctcccag tgcggccaaa      180
tactcagcag gtgctgctct cagtgttctg gggtaaggat tcgcctctgc aggagagagg      240
taggtggggc ccagcccagc accacgtgga aatcccaggc aggggtgcaag accactcacc      300
agcatgcctt ggaggggaag gagggcccgg atccggaagt ggctgggtccc tgcaactcct      360
ttgcttgtgt acagcaacat atctgagaac agaaaaaaca tcctctgctg caagcccttc      420
ttggtgagct tgtgaaggca gccctcacgg atgaactccc tg                          462

```

&lt;210&gt; 426

&lt;211&gt; 532

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 426

```

ggggaagaca tggacctttt gttactgata aaattataac ctattactat ttttggttat      60
tgttttaaca taacattatt ctttgaattg atctcaaaga gaggaatatg agaggtcact      120
gaaatgaccc tggcagtaaa atttgctgaa aagcagcgtc ctttacaagt ccttacctcc      180
gaccgcaaaa gagtcttcta aagaccactc tcagccctca agggtccttg caagtcagtg      240
acaccacagg aaatgggaac cttgccaaga attagggaaa ttcagggtgc tgcaagtccc      300
taaaccctag ggccaaaaaa aggatttggc agatgtttgt gtgtcctgga ggcagatgga      360
tgaaagtatc agtaggctcc gtggcttaag tgctagtcag tgctcgccat tggctctttg      420
cagtcttgtc acttctgtct ggaggcatc aaagagctga aaggtacaca gtgcagtggg      480
aacatctgga attgacccct ggctccacca tcttcatgat tagtaaagtc ac              532

```

&lt;210&gt; 427

&lt;211&gt; 666

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguousl  
y

<400> 427

```

gggaacaggg cctggatgga gaatgtatac tccatcagca ctaactctgc tagactctct      60
tattaatctg ccctctgaag gcatttgggc ttgtggccct tgagttagtt ccatggcttt      120
ttcaagaaag atcctgcagt tccaatgtga gcagcagttg tttccaaggc taacaatttc      180
acgccaaacta gaagcctcca caagtcaggt gccaggcatt tctaagccag tagagcagct      240
ccgcttgttt ctctgggtga gtcctctcag ggtgagaccc tgtctccttg taagcacnnn      300
nnnnnnnnnn nnnnnnnnnn agacgggagc caatcaaagg caaactgcgt tagacagctc      360
ttccatgcgg tatggacacc aacattcgat catccttggt tcagagaagg tgccggggccc      420
cagacatgtg cttatcactg ggtcccatgg ccttcaatcc tttaaagggt tttaagggtg      480
ctgattttta tcccagacat tgatcatggt ttttttcatg cagaatttgg gcagttgtct      540
ggacattagg agttgagtca cctcctaccc atgaggaaca agcctgtggg gggactgata      600
ttatcacttc tgtcatcaag aaataaggcc gcaggcatcc ctgaatatag agcatttatt      660
aatcga                                           666

```

<210> 428

<211> 558

<212> DNA

<213> Homo sapiens

<400> 428

```

gggtgggatt ctggggaacg tcggcatgta aggcacagtt agaaggatga agaagaaggc      60
aggagaggta agaaaccaag agggtagcgt gtaagaacca aggaaatagt ctttgaagaa      120
aaaaggaacg gccggcaatg gtagtgctga gagatcaatc aaaattagag ttgacaagtg      180
cctgttggat ttttcggtaa agaggaggat gtaggcaacc ttgtgggaga gtggtgtctg      240

```

gagtggggag gccacttcca aagagcaggg cagatctggg ttcaactggg caaggaaagc 300  
 ctccctttccc tgagcagcac tcacagatcc aaagcctcac atgataggat gttgcttccc 360  
 acagggccccc ttccctatatt gcaaaatgga acctggctct tggcttgtgc ttccagccat 420  
 ggtgtttggg agtgcttgcc agaaaactga tattgcagat aaatcctgta gctcctcact 480  
 ccaacctatt ttcatctctt gggcctgata atgtgtttgg atggaaggca tctcctgatt 540  
 ctgaagtgat cttaattc 558

<210> 429

<211> 517

<212> DNA

<213> Homo sapiens

<400> 429  
 atcacttgaa taatatttaa acctatcgac taggccaccc cactggatca gcagcggaat 60  
 ttgaaataa tattcaaata aggtttgggt ttccaagtta cactatTTTT taaaactctc 120  
 aactctgca tcttcataaa ctatgatcac agtttattaa atcaacacaa tgaagtctac 180  
 acaccttccc actctagttc aaaataaagt ttatcttata actaagaata cctatagcaa 240  
 aatgattaa acacgaaatt agataaacat tacataagca aattgaaatc agttttcata 300  
 ctaatgctac cttagattca ttcacagctc tctaaagaac agaggatctc aaggacctg 360  
 tggagagacc tatctgacct cctcagttta cagctgggaa ccaagcaact gggcttagac 420  
 tgagcccagc gacagctttc aatgatgct ctattttact tggaactgac tcttcccaac 480  
 catcactgcg atccctaggt aatgcatttt atttct 517

<210> 430

<211> 538

<212> DNA

<213> Homo sapiens

<400> 430  
 ttgtttttt gaggttttgt ttttttgtgt gtgtgtggga aaaacagaaa tctgagggaa 60  
 aagaacacag ttaaaaattg ctgtaaatgc tggagtaact cccaggagat taactgttct 120  
 gaaacaacca cttatactaa ctccggatta aacaaagcta tttgttcaa atcctctttg 180  
 aaaatcctcc agaagtatca cagttctgcc caaagataag aaagtgtgaa acacgtcgct 240

tgttttacac ctggtagctc atggctcctc catgatttaa aacgtcgggt ttgagtttgg 300  
 tcagtgggtgg tcctagctgt gtgcgctgat taaaggtagc cacgaaacgc tggggaaaaa 360  
 agaaaaaaaa aaaaaacaag agaccaaact ttotttgatg gtttatattt ctgcctgaat 420  
 ttgtaaatgt taattgtaag ttattttgtt tgacttttaa tctcctcca agttctttaa 480  
 aaatatgaca tgcttaacat gagcagctgc ctctgtgcct tttctgtcgc ctgggagt 538

<210> 431

<211> 619

<212> DNA

<213> Homo sapiens

<400> 431  
 catctatagg gttgagttct gtgtcataca aataactaaa atgtattaaa tgagggaatg 60  
 aacagctata aaaattgctg aaaatcagct aaagacaaca atctcaatgg atccactgga 120  
 ctagtgcata aagacaatat aaataaatta gtaaattaag cctgaaaaga aatagtaatc 180  
 ttgccagaga gaaacataaa cagatatata tgaagaagag aaaaaatggc atacaagatt 240  
 atgactocta gagataatcc ttatcataac tgtgggtgct attattttgt ggctaaacaa 300  
 gacagaaaaa cattaaaaag agaagttttg cttcaacttt ggtcaaaaat attagggttt 360  
 aaaatttacc tactgctttc ctttcacagt caggcttttc caaattttta ttctgaggca 420  
 taattattta aggccatata ccttttctat aactacattc agtattcaca gaaaaaactg 480  
 agcatgcata ggaacaaaaa agactaaaag gctagaatgt caacagtgat actccatggg 540  
 tgacgggttt caaaacaatt ttacatttt cctatatatt ctgaattact taaaatgagc 600  
 cataatgttg ataatcagc 619

<210> 432

<211> 456

<212> DNA

<213> Homo sapiens

<400> 432  
 ggggaaatta cagggtggaa ctcggtcaag aaaaaaaaaa acatatatgg aaaaatgtaa 60  
 actttgagct ccatccctga agaactctgg aaagtctgat ggagttatat actcaaagta 120



gcaaagtga atcatacc aa tttctttt ggcaaaagaa atacatggga aagaatagaa 180  
 gggaaggga ataagatggg agaaaggaat caccaacatt aatgctgtac caaacaattt 240  
 tttaaataga ttctgagtag ttgaatattt gtagttggca ttaggaataa tgtcttatca 300  
 atatctagaa tactactact agaaatctag ctaactcttc ttttaattag aaaagtaata 360  
 aggaatggat ctttgggtcac ttccagcctct gtagcttctc taagacagga caattactgg 420  
 acttatctta tgacaaaatt atatataaat taggca 456

<210> 433

<211> 694

<212> DNA

<213> Homo sapiens

<400> 433

acttaaatca ttttcttgct ttccaaacaa aggactataa cgtaacacaa aatgacacat 60  
 tacactgatt gacagcaaat ttagatagaa aaattaaagt taacatgtag ccttaaaaaa 120  
 agaattaatg tcttaccctt gaggtcttg gacggtcttg ttttcaactt tttgttcaca 180  
 ttctttttatc atggaactta aaataacctg attaaaaaaa tttaccttag tgaaatacag 240  
 tttacatagt aaaatactat ggtttaactc aatgttttaa tttttaatat tcctataagc 300  
 taatatgtta attaaaaatt tagttttggc agttactttg ttaaaggaat tcatattaga 360  
 ttgctagact aggttcagaa gtagctttta aaaatctcaa tcatataaca ataatttatt 420  
 ttgattttca ctagtcttct ttctaaatgt tttctattct cccttagctt actcaccatc 480  
 ttctaagtgt aaaagtaaaa tttatataca tctatatatt taacatacac acacactatg 540  
 gtcacacaca tattttccca gtaaaagctg tcctgttcta cgcccccttg ctttctccag 600  
 gttgcaaaaa gcaagatccc ttattttaat gtctagagct gagactaggt acagcaccat 660  
 ggctattaaa atataatgag ggatattgctg ggtg 694

<210> 434

<211> 757

<212> DNA

<213> Homo sapiens

<400> 434

aaaaagggaag gattataaaa aatagaaaaa aatgagagga atataatttg ggcttaccaa 60

tatttctatg aagtacgaca tgatttaaca ttgctgatat taagttcctt gcaacttact 120  
 atatccacta tagattgtat aaaagtagtt gtataaaagt tgaaggtgag gtccataaat 180  
 atttagacta tcttttttat ttcctgaatg tactataggt catttatgtt ttcttatatt 240  
 ttaattcttc cagttaccag acattttgca aacatttaca tggcaatatg tacttttcaa 300  
 agctcggaaa actttccttt tctgattgtt ctcttttcta ctgtacatat taaaatttga 360  
 atttcagaca tatattagac aaatatatac aaagtttagg ccataccagg aagtagacag 420  
 ttttagagggc attaaatatt tgagaaatat gcttatgttt ggtattgtta ttgttttatt 480  
 tttggtttgg acttttaatt tcctatttct tattagtgtc tcattcaaatt ggattttattc 540  
 gatgtctcta agatttgatt tccttttctt tttcacacaa ctgtgtgttt gctcattagt 600  
 aaaagttgaa taatatatag tgtttacatt ttaatattta attgttggat gaatctcact 660  
 tcaaggggta aaggctatag ttcattgaca gtgatgaaat aacctagctg gctctcatgt 720  
 aaatagcaac gaatgtgcac aatagttaca ttacatg 757

<210> 435

<211> 421

<212> DNA

<213> Homo sapiens

<400> 435

agaaatgaga aaatagtctc tttccttaga gatcttctct aagttgtgct cattctacat 60  
 atggcatgat gtacttctgc tctttcccct ccttcaaccc cgcttaccac acagacccat 120  
 tctgtttgct gttgctttta ctcttaggca tataaggcag ggtccaggag aggccaggtc 180  
 cagaactttc aactatcctc ctccagtga gttacacaga tagcactaat ttgcccagc 240  
 aatgacatgt agcaatgtgc atggagtatt gccagccaga gaaacttacc caggctcacc 300  
 acggtgtaca gtttttttat tggggtcggt catggattta tagctgattg ccacatggc 360  
 tgacttttagt cttttgcccc tccagagggt aagctggtac cttgagggtc agggcaccta 420  
 t 421

<210> 436

<211> 421

<212> DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 436

```

gggtgtactc aggggcacat ttcacagttc tttgggggct ttctagaaaa acaggccagt      60
ttgtaaggag tattgagcca ctggactggg gtgtggcctc tgtctagaaa aggtcagtgt      120
catctgaggg atgctgcaga aggtggccgt tgccatgtga gtcacgcagt ctgtattggg      180
aatggtgtgg aagtggaggc tgaatctgga ttactgaaaa ccgtttctgc attataaatg      240
ttggatttac acatgcagtg gctttcagtt gactctttca ccctcagaat tacagtgtta      300
tattcgtttt tgctttttac agtcatcatc aggcaaagaa aataaattac agaattagac      360
atggcttttg caaatgtgtg catttttgtc ccaaaggaaa cagaaaggtc acccttggag      420
a                                                                           421

```

&lt;210&gt; 437

&lt;211&gt; 478

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously  
y

&lt;400&gt; 437

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gggggtaggg agcaagtcag ccaccaccag aggtatttaa ataccagcta gacaatcact      60
ccacggggac aggttccact ccttgtgaaa ggggtcaaata aaatcttctc ctttggcaccc      120
caaaggagat ctagtggagg gcccaacaca ttagatacac aacaagtgtt gctgactgaa      180
tgaactatgt tttcacacag attacaggtc aagcaaaata ctaatgtaac tctaatatat      240
taagggcacc gggtgaccac tgagggtactt tatgtggttc caactaagaa ataagttgga      300
aaatcaggtc atgaaatgag ttctgatgct cctaagtaaa aggtttgagc cactgtgaga      360
gtcnnnnnnn nnnnnnnncc caaaggctct tcccatgaac cctatgctca agtcaaacag      420

```

ataaagcatc gctaaaacac acttcagtgc ttttaagatt taggtctaag ccaggtgt 478

<210> 438

<211> 440

<212> DNA

<213> Homo sapiens

<400> 438

tggggaagtg tcttacccaa agtcagtgat ggagtcaata acctttcaaa gcatgcaggg 60  
 agggacatag ggaagagAAC atgatttggg cttggagcta aagacaggcc ctctgggagg 120  
 ctgctccatt cctgcaggcc caagcatcag tctgcatatt aacctcttcc cttgtcccc 180  
 tgccccaggg ctgtaccaac tcatgaactg tcttttagctg gctggcctta cttgttggag 240  
 ctgtgggtag tgcaagtcaat acaatggtag gctgggaccc aagagatccc aaataagcag 300  
 gataaaattg ggtggtaaaa aagggaacaa aatgaaaaaa accaaagtgc ggaaccttca 360  
 aggctcatgc ctggagtctt aagaaggagg atctggataa gtagatggaa gagtctgctt 420  
 tcctgaatga cccgcagact 440

<210> 439

<211> 487

<212> DNA

<213> Homo sapiens

<400> 439

ggggtaacag acatgaacta cagtatataa acatcttctga gatgaaaata tttaagttta 60  
 gagacagaag atcttttggt ttagtggttg gtaaatcagt aggttgggta ttctatgaac 120  
 tcagggtttta aaagcttcaa taagatgaga tctgtttctg taagggtgac cagttgatcc 180  
 tacaagtgag aacacattca ttactgcac tgaggcagaa cctattgttg aaattatattt 240  
 atcttaatat aaatactgcc aggtattggc tggttgatcc atcatgcaac aaatggatat 300  
 gtaaccaaatt ttacacactt gtctaagaga aagtactccc ctcaatacta caacattaaa 360  
 tatgcctttc tgtatttttc accatctgag gcactagacc ctagtaatat gtctttatatt 420  
 tgtgaggggt caagaaatgt ctagctagta agagaaactc ttagtttagc tatgggttagt 480  
 agcactg 487

&lt;210&gt; 440

&lt;211&gt; 471

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 440

```

ggtggtggcc gcatagaagg agaagaggca gaactcacac tataaaggcc atcctgaaat    60
tacagaactt tccctttatc ataagggtaa tgggaggcca gtgaagggaac ctcggcctgg    120
taaacagggtg agtgggacat gatcacattt gcattttgaa aaaaaatcac tcaagctgat    180
gagcaaaggg gagactgggg cggaaccagt cagtctctga taaaaacaaa tgtccaatcc    240
tattcgctga attcctggta tatgcaaaaa actagaggag gtccttacia aatgctcaaa    300
gcaattctgc aaatacactt cagaccacag gtggagctgc ggctggagag aggagtgtgc    360
tgaaatcaaa tggtagacac tcgcgacatc ctccaagctg aaccagccg tccacacgat    420
gcaaataaac attttgagtc ccacacctac ccaccatgaa atttacagat g            471

```

&lt;210&gt; 441

&lt;211&gt; 400

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 441

```

ggggccaaaa aaaatgtatt tcattaggtg ctgggcctac aaagatagag gtgtgattac    60
tgccctctgg gaactcatag tgtagaatg caggtggata ttgacaagca accggaaaac    120
tgtgtttcct actaggggca tgaggaagga gctatacaaa tagatcaagt aagctaattc    180
tgcctagggc atagaagaaa ggtgccca gaagtttaca gagaagggga tatttaaata    240
gtcccaaagg taaacacaat ggtaagagga gaacagtcct tctaagcaaa gggaatggca    300
agagtaaagg catggagata taaacacaaa ggcttgtgtg ttaaagggtg aaggagttag    360
gaggaagcag tatgagatat gagacagaaa atcaccttag                    400

```

&lt;210&gt; 442

&lt;211&gt; 472

&lt;212&gt; DNA

<213> Homo sapiens

<400> 442  
 gggacctggg gtctgggctc aggagggcca cggcccctcc cactcctgag tgtgtcggga 60  
 ggctctgccc ccatcgtgct tcacacagga cagtagaagg ctgggcgggt caggccttgt 120  
 ggagtatggg tgcagagggg gcagtcgcag cacgcaggct gagtcagggc ctggggacct 180  
 ggggagcagt caaacaggat atggaagggc acctctgtcc tctgttcaca ctggacacca 240  
 tcacccatca ccagcccgc cggcggatgt cagcacacac acctgcactc agcgccactc 300  
 cacagccact gtgggggtccg gagcagctgc ccccgcaactt gggccgctg gccttgtctc 360  
 agtctgcctt gtcacctgtc aggtggactc ctggagtacc cccacccga tgtgtgagtc 420  
 tctgagggac ccaagccctg aggcactcca ccccagggtg ctgcagacac ct 472

<210> 443

<211> 541

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously  
 y

<400> 443  
 agtagggat ctggtgccta agaggtactc agtgaacttt tctttccctg cctaggttta 60  
 aattagaaaa gaaaaagggtc aaattaggag tcttttagta agcccaagtg aaccatagca 120  
 tgagaaatag ggtgtaaaag cactgagaaa aatcttgcac tttcctctga aaggcacact 180  
 attagnnnnn nnnnnnnnnn nnnnnnnact ggaaaaatga cacaagtatt taatagatta 240  
 gattaaatct gagaaaagta cgtttaatgg catctttgta tcaactgatg ttttattttt 300  
 catccccccc caccagttct cttttctgta atattctggg taaccttttc ctgattccgt 360  
 aaggaaatgt ctgcagagaa taataaatat gagtaaggct atgtagctaa ttataggtta 420

cattctctct gactcgtctc agcaaaactta caaagaccaa taagaacttg aggagtatta 480  
 ttccttgtct gtctttgtcc ttccccttac aattctactt tgactctggt actttcatat 540  
 a 541

<210> 444

<211> 522

<212> DNA

<213> Homo sapiens

<400> 444

gggtacatgc tgtgtggaat gtttctgaga gatTTTaaac tgcaggctcc taactaccca 60  
 gtattcttcc tggccactcc ttaaagaatg ctgggcagaa aggaatctca gaactcattg 120  
 gctggtgcct ccaaatgggg gtaggcagta ccagccttca aggaagtgtt tggaattgag 180  
 tgctggtggt gggggaaggg gttgcttttg gtcattacaa tagtgaataa cctagtgaat 240  
 gctactggct tcttaggggc tcaagggtcag ggagtctaaa attcctatga taggagaatt 300  
 ctaatggata aggaatagtg tgtcccagac atcagtgcac ttcaagaata tggaatcact 360  
 catTTTatag ctgagatcca gaaggattat gtgctccagg ggccgggtaca gagcacagat 420  
 cagctctcct caaatacagc ctcccttcta cggaactca ttctagtgcc ccacagtggc 480  
 ctcttcatat ttgttgcctt gtgttcagag aatcccaagt ca 522

<210> 445

<211> 574

<212> DNA

<213> Homo sapiens

<400> 445

gggtgtcaat gaaggactta aaggacttaa aaatggctct gttctcagaa ttcagggtag 60  
 gccctgttct gagtttcctg agaattctct gggaatgatt tttgagtgat aagtacatca 120  
 aatgtatggg tcctTTTTtg ccatagggcat cactagacaa ggcttacagg tggaattgct 180  
 tgagttctga agTTTTTgt atgcttaaga agtcagtatc atacagtata aaagtactat 240  
 aaaactagga attcacaaca aggtgaaaag ccagaggcag aaaaatgaag acatgggaag 300  
 agagaatgaa attacgtgta caataattta caagttatta atattaaaca agggtttgggt 360  
 atttcttcc agataaaaagg cctaataattt, attacagtga aaaataatca gcaaataagt 420

tgatcatttct ttccacattg attccagaag ctaaattgtca ttttaattgt ataagtgtta 480  
 gcttatggaa gttgggactg agtttgggtt ccttgaagaa aatttaggaa agaaggggat 540  
 aatgattaga aaaatatgtg ggatgccagg tatg 574

<210> 446

<211> 719

<212> DNA

<213> Homo sapiens

<400> 446

gggcagaccc ccgctcctag actttgccat cctgggtatc aacatgcaca aaaggggaaa 60  
 cagtagtgaa acttgttgcc tgctgacaaa ccttgatcta catctgtgtt gccattact 120  
 tgttcaacaa acctgttact ttttttggaa ataataaata attcaggga agtcattttg 180  
 aatccgctga catctgttgc ttgtacaact ctgaattatt catcagtga catabacagt 240  
 attaattaaa gaaaagtact gaggcagacc attgaaatag aaatgaacat tgcagaagaa 300  
 aatgccttta ctgagagcac atttcacatg tcattgacaa atatcacaaa gaacatgcc 360  
 gtccttagaa cctaaaggaa ctgtactttt agaaatcaga cggcaggata tcatgataag 420  
 ccttattttt atttttccaa ttttattttt ttcttccctt cagaaaaaaaa aatcataatc 480  
 tttgatttgg tctgtttcaa gcattctacc cgtttgtcct ttgttccaag aagccgtatg 540  
 gcattctatg agaaagaaag tcttactaat tgagattcaa aagaatcaca agaataagtg 600  
 tcaggaataa gtcacaaagt gctcatttgt aaactgagat ttagacatat taatggcaga 660  
 ctcccgccca aattaaagat agctcaatct agctaagat ttatttccat gacaacctt 719

<210> 447

<211> 566

<212> DNA

<213> Homo sapiens

<400> 447

gggaatttag ggtgttggga ggataggacg tgctgaaaga ggtgctgtgt aggacagga 60  
 ccagttcttc cctacccac ctgactcctt tcacagggtg gagctagcac taggcagttt 120  
 tgaagtagat caattcatct ttgccacaca gccatctact tttctgtact ttcttgacac 180



tctctcttct ccctgagtc ttcgtagcct cttccagtc cactgctgct gctgggtaaa	240
taggaggatt accctgggaa aggagaccag gtgcaaaaat gatatttcag gaactaaaac	300
aggctgcgtg aaaggtctag gtcctgaaa taccacgttt ggggatctac aagtggtttc	360
gtgtaactag aatagaaagt gcttccatgt ttcaatatta cttctctctc ctttttaaaa	420
aaaaatcctc atcaaaactt tatttcactc aatatagctt ctttcaacta aatgagggga	480
aaaaaggtaa tctcactcaa tcggttaata caatacagtc agccctcagt atccgcgaat	540
tccacaacca gccgcagatc aaacat	566

&lt;210&gt; 448

&lt;211&gt; 644

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 448

cttcagtaat tacgttagaa aaattctgca gtctaaaacg gcccaaagat aaggggcaga	60
tgggttggga cagtgaaaaa aacaaattac agactgttgg taaagataaa tatttttgtt	120
ttgtgtaata atcaacaatt tgaagtaagc taactgggtt tcttaattga atgaataaat	180
atatatatcg tataagtagc agctcaatac acatatagaa catactgtta actctaaaaa	240
gctaggctaa tttatattat taaatagggtt tttagcaaaca cattttttta agaaaatgcg	300
gagtagtcat cagaccagct caagattatt gacctcattc aaagttgtga gcttagaatt	360
actgcgtatc ccaaatttgt caagtaagag ttaatgagaa tttaactgac ccggttctct	420
acttcataa tccgtgctct gtggtacaga tgtcacttat cttcacaact caccgagagc	480
tctgtttgac agtaactggg gaattgtaat aatacagtaa ccaatatttt gactgcttgg	540
tgaactctca agaagatttt tggatttata cattgctgca ttttaggacc aaacagtttg	600
ttttgcatac ttgaataatg gaaagcaaga tatcagttgt gctg	644

&lt;210&gt; 449

&lt;211&gt; 519

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 449

ggggtgcggc gaggcaacag agccgttaaa aagcgtgtgg aattctatgc tgaattcttc	60
---	----

```

aagttctgac ttcattcatg ggactacttt cttttatata gatagtgatt ccagaaataa    120
tgtcccataa tagtatttca gaggtgctct tgggcacaat agctctagat agtggagatt    180
aggtagatat ttgggggtctt acttcacggg cgtgttatat gagaaccttt gcatcatcca    240
ttttgcttct aatcacgttt tccatttctg gtgtgtgctt cctcataac cctgttttta    300
tatcataacg tttgctgtat cagcaccat tctctttcca ctgctcagtt ttaaatagct    360
tcattatgaa aaatatagta cttaaaaaca tggcacaat gtgtattact tcagcacaag    420
ataaagagat tactgagaag tgcactgact gctgaagtaa ctttatccta agggatatatt    480
cgctacttta attgattttt tctgtccatt ttattaaga                            519

```

<210> 450

<211> 403

<212> DNA

<213> Homo sapiens

<400> 450

```

tgacacttgg aaatcttaat cacaattatt ctttgttttt ataatgttta ctgttcaaatt    60
caatttctgg ttggatagta tgtatatata aagccatgct caatggccta gatataattta    120
ctgccaaatc ttttatgctt ttagtgtttt ttttctggac aagatctatg cttattgcaa    180
taaattaaat gcaaagaata ttctagtaga aagtcagtct gcacttccta aacccccacc    240
caccaccacca attccttcat aactgttatt aacagtttagc tgtgttttct aatggattat    300
ctccaaagta tatgtaactc agatttttgt gaggtaggaa aagaataaca ttaattccac    360
ttcacatatt gaaagtctaa catacaaaga gattaaatat ctc                            403

```

<210> 451

<211> 709

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously

y

<400> 451  
 ggggtacttt tagaggccac aaaaatatct taatttttca cttttttaaa tttagaaaaa 60  
 aaaaatgaat atataacaat gaatccagcc aggattgttt ttgtctttct accagcacia 120  
 ttgnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnngaggaa ggcaaaactg cccaggggccc 180  
 ccaaaagtca taacgcagcc cagcccacat cctctgcccc ttagaattca cagtcaccct 240  
 agctgcgggt gtccccacct ccaggccaca ctctccctccc cccaggcgag ggcccaggca 300  
 atcagggtgt gaccccgttc tgacccctc cccttcaggc tctggccagg gcaatcacag 360  
 ctactgatg atctcaggat agagtagaac attcactgga acccagaaag gggagagtgc 420  
 gtgttagctg aatatcctgg gtaaatgggc aaagaaacct cttttgttcc agtcctgggg 480  
 ttattcattt acttatgaca ctttacctac tgccacaaag gattcaaagt cacaagaatc 540  
 tatgtaataa aatagaaatg tgtgtaaaga gaagtttaaa agtcagagtc aaggaaaaca 600  
 agtagagagg agacagctgt ggctgggaag cccaggggat ggggaaggtc cttgccgtaa 660  
 ctgaggcagg gtcacacaca tcacttcagg ccacctagtg gtcacagaa 709

<210> 452

<211> 482

<212> DNA

<213> Homo sapiens

<400> 452  
 atgtgaaaag ttcttatcac totaatatgt taggggaaaa ccatctcac ccattgtccc 60  
 cttttctccc atttcatta tctcccccac atgttttaaa ttgggctaaa ttaggctgag 120  
 tcaatgtttc atttttctc cttcacaaag gtaggggaca tggctattca ttgggccatg 180  
 ttacttagtg gatgttattc aagatgactg ccttaaatag ctttttttac tctctggaca 240  
 tgtatatacc aaacagactt tgaacttaag ttgcttgtct tgcaggtaga ctaggccagg 300  
 gactttctga agaagctatc attctctaga actctacaac agagtgtaac ttagagccct 360  
 gttatatttc caatgttagc cacattatcc taaaagctg ctacagagct ctggctctag 420  
 gaggtgggtg gagaatggcg gaccagatac cctgattggt taatgatcct attacctgat 480

tc

482

&lt;210&gt; 453

&lt;211&gt; 633

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 453

```
atgaggccgg gcctgcaatg atgtgaagcc cctgaggacg cccgaatggt ggcccaaagt    60
ctctctgacg ctcacatgc cctgactatc atactatctg aacgactttg gctgggactg    120
gagctcttaa attttacaag aaggaaaatc agttctgacc caccaccata caacttcctt    180
gaggcgcgag ggtgtccaca atctccacag aggcggcatt gggtcaccgc tggaggatgc    240
agcaggaggg aggacccgtg aggagcgccc cctgtaggac cggaaccctg gagggttcgc    300
ggcaagggtc tccggggcat aggaaacggg catcccccac gggtagtctg agttccgccc    360
agccccattc ctggatgctc acgccgtctc ccctaaactc cactgcgct caccgggagc    420
ccatctcatc atcaccacag cccgtggcta atgggccaaa acagaagaag aaaagcaact    480
ggcggagtac aacgcgcctg cgcattatca gactcaggga caggctggaa cctcgccccg    540
taagtaggcc atttaatgac gcgcaaactg ggaaggccta tgactgttga agaggataat    600
cagaagccaa cccctacggg tccccggtag ctc                                633
```

&lt;210&gt; 454

&lt;211&gt; 576

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 454

```
gggtaatata aatacacagc attggtgtat attactatgc aaattattta tgggtattca    60
atggcacaaa aagcactaca gctgtcatga atatattaat actgaaaaat ttctcaaaca    120
cactctcctt atcaaattta ggtcaaaatg ctaaaagcta agttcatagt ctttatttag    180
gtaataatat cagtattcta tcattaatag tattagttaa ttctttaag agatgatatc    240
atcattaaga gattgaatat attatatata cttcagccac tgcaagcata aattagaatt    300
caatcaaatt gcccaagtaa tgaatgaaca cgggtactaac cgatgtgttt cttctggatc    360
tacgagagta gcgctcactg tcttcctaac aatgaagaaa cagcatgaaa aggttagaga    420
```

cagatggaca caggaaaagt gctttaaaaa agcttaggta gtcccaactgc accataatac 480  
 agcagttctg atctaaatgt cacataaata ttttctttgc cttcatttaa aggctttaat 540  
 taaaccagtg ggtaaaaatg tttttttctg ggggtgg 576

<210> 455

<211> 464

<212> DNA

<213> Homo sapiens

<400> 455

gggcagtgtg gagtaccact tttgctctga attcgagaac cctggagccc ggggattagg 60  
 agaccggagc ctgctttact caaaagctgt gtcattttgt ctttaaagtc acagcctcgt 120  
 gaggtcatca ccaactgctc ccagtagcat ctgccccaaa tagtactgac atctgggtgt 180  
 tttaaaaaga agactcattg ctgtagaatt acaaagagca tctaaccatc atcacgcagc 240  
 acttttgttt ctgtccagct tgaactaaaa ggagagggag gaggccatca atggaaaatg 300  
 taagtgtctt ctttgaagag ttaatctgct gatttcacgg ctgttcttct tgccatttct 360  
 catctctcag atacaagcac gaacctagca cacacaagac ggtcacgtag ctgttcattt 420  
 cacgatggga tcagaagaca agctctcatg ctccaaagcc cctc 464

<210> 456

<211> 458

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously  
 y

<400> 456

```

gggcgagtgt gtcactcttt tgactctgcc catttctcta ggacgctaga aggtagagcc      60
ctggttttct gttaggcacc tctgtgtctc tttctaggag ggaagtggcc ctgacagggg      120
tcctcctttg actcagccca catcccagaa tgctggagga ctgagtccag gtttctggca      180
gaccagtcan nnnnnnnnnn nnnnnnnnnn nnnnnnnntg ttcaagtttc      240
ttgaagaatc tccaagaaag aaaaaaaaaac tgttataaac tctttgtgaa taatgaatga      300
atgagtgagg acaagggctt ggcgttgtcc tccactttgt agctccacgg cgaaagctac      360
ggagttcaag taggccctca cctgcggttc cgtggcgacc tcataaggct taaggcagca      420
tcaggcatag ctcgatctga gccggaagtt tataccgg      458

```

<210> 457

<211> 481

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguousl  
y

<400> 457

```

agggggaggg gtggaggcac ggcaggctcc cgggtggcagg atggcctgag aagggccagg      60
atgaggcagg gtggctggcg ctgccccaga tgaaggtgtt tgaggcacac accatactcc      120
aaacggaggt gccccacagc agagcccaag cagctaagtc ggggaaaggg cagtgggcga      180
ggtcagaaag ctgggtcatg caggccaagt cacttcccct ctgcatctca gaggtccagg      240
gttagaaca aagtttgagt ggctttggca agcagtggct gttaactcac nnnnnnnnnn      300
nnnnnnnnnn nnnnnnnnnn nnnnnnnnng tgggtgagcc ctaccaagct gacctgcaga      360
aggggagata gacactaaac acataaatga gcaattattt atgacagtgc ccagcacaca      420
gaaaacaaca aagtaggccc ctctgcggag gtgacatttc ataacaacag cagctcgctg      480
a

```

&lt;210&gt; 458

&lt;211&gt; 500

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 458

```

gggagctttg agaagaaaaa totgtttaag tgaactactc tggctatata tacatatgga      60
ggtttgaaga gtttgcctct gagcattttc ataattgaat ccttttgaga aagtttcata      120
catcacacat ttaccgtgtg agatttggtg agtataaata tccaagatg tatttgaagc      180
tttcttaatt tggtttgaaa aaattagact aatctcatgg cttccaaaaa agaaagtcca      240
cactatocca tcaattaata gatttaattt ttgataaatt ttggtaaagtg gtgctgttat      300
tactggttct agtatgttac ctagtaccta gttgggtttt tgggtgttg ttttacgtat      360
tttcatgcac tacaccaata agttgcacca atagttgctg tcttcttatt ataggagaa      420
ggaaagcaga gtgttactgt taaaaactca gatgtgaatt gttgaatcaa atttgacata      480
cttaactcga tgaaaatttt                                     500

```

&lt;210&gt; 459

&lt;211&gt; 500

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 459

```

tgcagttggg ggcatttgac ttcctgagac tgctgccacc aactacactc atgccctcac      60
agtacgcgac gaagctatag tttggaactc ttactaatgt ctataaagcc agtatgatag      120
caatgatggc aggatcagat tttattaaga cctctactgg aaaagaaaca gttaatgcc      180
ccttcagaa catagtaata taccgccatt aagatttctt ctgaaaactg gaaacaagat      240
agttaaacca tcagagcatc ccagtgcaaa gattccttgt tgctctatat tccaaccgga      300
gcttgagat gagtggctga agccagaact ctttcgaata ggtgccagta ctctgctctc      360
ggacattgag aggtaaaatt accatcatgt cactggaaag atatccccct ccatcattat      420
ccctatctat gttaaaatca ccccaatcc ctataaaact ctttacaatt cgagtcaaaa      480
ttatctttct acgtaattgc                                     500

```

<210> 460

<211> 499

<212> DNA

<213> Homo sapiens

<400> 460

```
ggggtatgca ctcaagccat gcacactctg atggaaaagt ccaagtctat gccttgagtg      60
cataccccgc ccgcgacacc gtgcctgagg actggttttc ctgatagacc cttgtctgtg      120
ccgcacaatc agggcagaca gaactcagtg gttgttactt acccaatctg attataaaaa      180
aattggaacc aggagaccca gagattatag caagttgatt ttttaaaaaa tttatctcaa      240
actggtgcca ttgcaaacc aagccatttg agtgccaaaa cctgggtaaa cagagaaagc      300
tggttaacgg acagagaaaa agaaagtggg catgttttac gtcaatttcc ctggaagcag      360
aacctgagat ggggattccc tcaggggaaa cctgcagcgt gctgaggag gtggagagtg      420
cacacaggta gctgggcaaa gaggtggttt ctgctgagcc ttcaccctgg tctcatgggg      480
agctcccggg atgaatggc                                     499
```

<210> 461

<211> 642

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> ()..()

<223> "n" is a single nucleotide whose identity could not unambiguously  
y

<400> 461

```
ggggatcaaa atacaagcat attatcgtaa caaaatattc ttttgggaaa attttgaatt      60
aagaaaaggg agcctctttg actctaattc tggtaggtac totatcgatt atgtgtgaac      120
tattttaact aaaatgcaac ttannnnnnn nnnnnnnnnn nnaatatatt tatgaaacat      180
```



```

agcagaatta ccaaaaaaag attgtcaatt ttcctaagtt aaatgtaagg atgcaaattgt 240
tctaataattg aggggagata aaattcaaaa ccattgggac tttgcttctt tatccatcac 300
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ctctgaatgg gtgagcagag atgtgcttta agatagaacc ta 642

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&lt;210&gt; 462

&lt;211&gt; 609

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 462

```

ggggaagcgg cagggccacc aaccacgaca gctgcgatag ctgcaaggaa ggtggagatc 60
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ggaatcacc cactcttccc atggtgactg tttggaatcc agtagggcct aaaaatccaa 360
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tgaaaaacaa aggctgcttc tccagcttga tggaaaatgg agttttctct caccacagg 540
caaataagtc actggtatcc agagacttgg catactgacg gagaggattt tgaacgcatt 600
tgtacccca 609

```

&lt;210&gt; 463

&lt;211&gt; 723

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; ()..()

<223> "n" is a single nucleotide whose identity could not unambiguousl  
y

&lt;400&gt; 463

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atgctggctt ggaccagggc gggcagggga ggtgataaga ggcgnnnnnn nnnnnnnnnn     300
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aaaatcagtg ggaaataatt tgcaaaagga aggtgggcaa gctgaagaga cagagaccac     660
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gcc                                                                 723

```

&lt;210&gt; 464

&lt;211&gt; 414

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 464

```

gggaaataga acttgagttt aaacctaata tgtaccatgc ttttgagaga gaacagcgga      60
gaaagcgttg ctcttcactc taagagggaa acgctagcaa atgcaaggag ttgaaaattc     120
aggcagcatg tttaagagtt aagtatagat cattttggat acagcagaga tcttaaatgt     180
caggattaca ttttgacttc tagagtaaaa attttttagca catatggact cacagagact     240

```

tcactcaaaa caatcttact gagcagctga acttacaaaa taaatacaag cagaagtttt 300  
 tttagttata ctgtaaaaag ggaccactcc ctggcagtta ccctgagaaa aaattcaatg 360  
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<210> 465

<211> 545

<212> DNA

<213> Homo sapiens

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 agagagaaga gcaacatgtg atggcccaca cgcgggaaag aagcatggag ccaccaggcg 180  
 aggttcttac aaatgaaaag aaaatgttga tgtgtattgt aaacagagag gtgctttttc 240  
 aatccaaggc atcgacacct tatttcaaaa ctacttacgc tacataatcc tgctcatctt 300  
 ctgcctgaaa gtgatatgtt ctattatcta aaataaaaaa aaagaaaaat aagtgaacc 360  
 ttagaaagca gggctactttc aggtacaaca cagatttaag ttcttgggaa gaaaaccagt 420  
 aaaagtagaa ttttaatat atttttagtt tacgccatta tgtgccaggt gccttgtgta 480  
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 ctgag 545

<210> 466

<211> 719

<212> DNA

<213> Homo sapiens

<400> 466  
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 cctaacctct tctccctctg gattcctgag aaccttcct tctttctggt tctgtgggcc 180  
 gtcggatcct tctgtttctc cctgcccccc acccgagcc tgcaacgaca cagttacctc 240  
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 tctgccaga tgacttagtt cttgtctatc caaaggcttc tccccctgct gtccctgtgt 360

agggagctga tctcccctag ggatgtccca cagggctcag aatgggagag ggtaagttct 420  
gagctgggtt cctgactgta cctcttgcc atgacaaagg cagagcctag aactccggcc 480  
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